

re-show glimpse of newest developments  
be introduced at the —

## CHEMICAL EXPOSITION

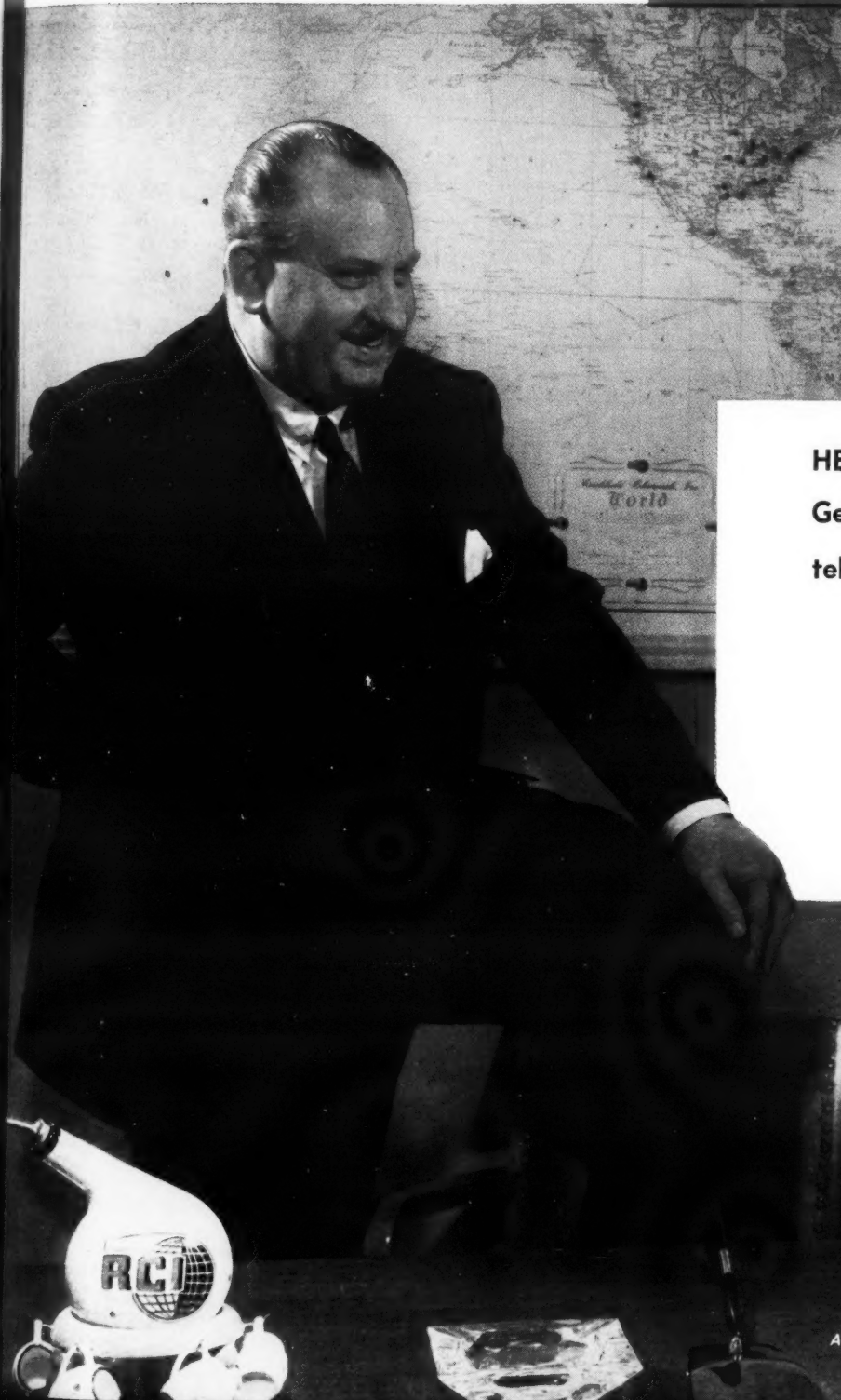
New York City, December 2nd through 6th  
see page 52

NOVEMBER 1957

FOR THE  
MANAGEMENT TEAM

\$1.00 the copy

# chemical processing



HENRY H. REICHHOLD, President and  
General Manager, Reichhold Chemicals,  
tells why he believes —

**A CHEMICAL COMPANY  
SHOULD NOT ENTER  
THE CONSUMER FIELD**

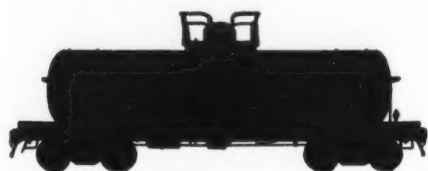
... page 30



**For  
FLUORINE  
gas or liquid**



**HYDROFLUORIC ACID  
aqueous or anhydrous**



**INORGANIC FLUORINE  
COMPOUNDS**



**see  
GENERAL CHEMICAL**

General Chemical's leadership in fluorine chemistry is well established . . . widely recognized. The inorganic fluorine compounds listed here are available now—in commercial or research quantities. Many others are under investigation, or can be produced readily if required. Whenever you need fluorine chemicals of any type—call *General Chemical*, industry's primary source of supply for elemental fluorine, hydrofluoric acid and the fluorine compounds produced from them.

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Elemental Fluorine,  
Gaseous & Liquid

**ACIDS**

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Fluosulfonic Acid  
Hydrofluoric Acid, Anhydrous  
Hydrofluoric Acid, Anhydrous High Purity  
Hydrofluoric Acid, Aqueous  
Hydrofluoric Acid, Aqueous, Purified & Reagent  
Hydrofluoric Acid, Electronic

**ACID FLUORIDES**

Ammonium Bifluoride  
Potassium Bifluoride  
Sodium Bifluoride

**ALKALI FLUOBORATES**

Ammonium Fluoborate  
Potassium Fluoborate  
Sodium Fluoborate

**ALKALI FLUORIDES**

Ammonium Fluoride  
Potassium Fluoride, Crystal & Anhydrous  
Sodium Fluoride, Technical  
Sodium Fluoride, Reagent

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Boron Fluoride Ether (Diethyl) Complex  
Boron Fluoride Phenol Complex  
Boron Fluoride Diacetic Acid Complex  
Boron Fluoride Di-n-Butyl Ether Complex  
Boron Fluoride Dihydrate  
Boron Fluoride Piperidine Complex  
Boron Fluoride Ethyl "Cellosolve" Complex  
Boron Fluoride Hexamethylene-tetramine Complex  
Boron Fluoride Monoethylamine Complex  
Boron Fluoride Para-cresol Complex  
Boron Fluoride Triethanolamine Complex  
Boron Fluoride Urea Complex

**DOUBLE FLUORIDES**

Chromium Potassium Fluoride  
Potassium Ferric Fluoride  
Potassium Nickel Fluoride  
Potassium Titanium Fluoride  
Potassium Zinc Fluoride  
Potassium Zirconium Fluoride  
Sodium Zirconium Fluoride

Sodium Silico Fluoride  
Potassium Aluminum Fluoride

**HALOGEN FLUORIDES**

Bromine Trifluoride  
Bromine Pentafluoride  
Chlorine Trifluoride  
Iodine Pentafluoride

**METAL FLUORIDES**

Aluminum Fluoride  
Aluminum Fluoride, Crystal  
Antimony Trifluoride  
Antimony Pentafluoride  
Barium Fluoride  
Bismuth Trifluoride  
Cadmium Fluoride  
Calcium Fluoride  
Chromium Fluoride  
Cupric Fluoride  
Lead Tetrafluoride  
Magnesium Fluoride (Not Optical Grade)  
Mercuric Fluoride  
Manganese Trifluoride  
Molybdenum Hexafluoride  
Nickelous Fluoride  
Selenium Hexafluoride  
Silicon Tetrafluoride  
Silver Difluoride  
Stannous Fluoride  
Strontium Fluoride  
Titanium Tetrafluoride  
Tellurium Hexafluoride  
Tungsten Hexafluoride  
Zirconium Tetrafluoride

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Basic Chemicals  
for American Industry

**GENERAL CHEMICAL DIVISION**

ALLIED CHEMICAL & DYE CORPORATION

40 Rector Street, New York 6, N. Y.



**that's interesting**

**Salting it away**

An average family of four will actually need about 1100 pounds of salt during the coming year. Most of the salt — some 275 pounds for each



"Pete, are you sure your family will need 1100 pounds of salt next year?"

member of the family — will be used in plants and factories producing the things we need in everyday life. These include toothpaste, cleaning fluid, leather, dyes, and photographic chemicals. (Better Living, Du Pont)

**Up she goes!**

A 2500-year-old record was broken recently. Not the phonograph kind, this is a weight-distance record. M.W. Kellogg Co. hoisted a 450-ton caisson 152' in the air as part of construction of a sea-based radar platform. A book of computations 1½ inches thick plus drawings and equipment lists were compiled in preparation for the big lift. Former record was held by Thothmes I, Pharaoh of Egypt, who raised a 380 ton obelisk at Karnak.

**Cryogenists 'flip' H<sub>2</sub>**

Cryogenists, those gentlemen concerned with refrigeration and low temperature research have found that hydrous ferric oxide can make liquid hydrogen behave in storage. Spinning nuclei in freshly

... Thought  
on project

liquefied H<sub>2</sub> magnetically for about a would re-c to pair off. and nearly liquid quic Ferric oxide flip as the stable mol immediate

**Big brain for little**

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**Making t**

Phospho stabilizing tion proje problems e soils, whe



"Joe, are y this roadbe

bearing st however, t pands con if not a strength is of phosph hard, dur duced.

Check 1737 opposite last page.

NOVEM

...resting

...Thought-provoking slants  
on projects and products

liquefied  $H_2$  are not paired off, magnetically speaking. Slowly, for about a month, the nuclei would re-orient or "flip over" to pair off. Heat was released and nearly two-thirds of the liquid quickly boiled away. Ferric oxide helps the nuclei flip as the gas liquifies so that stable molecules are formed immediately. (Denver Post)

#### Big brain for little business

A Long Island building team has set out to prove that small industry can profit by using a big-industry brain. At Westbury Industrial Park an electronic data processing center is available to industrial tenants for their use on a cooperative basis. Thus, what is normally a luxury for moderate size businesses may become a standard operating tool. (New York Times.)

#### Making terra firmer

Phosphoric acid as a soil stabilizing agent in construction projects may overcome problems of heavy clays. Clay soils, when dry, exhibit high



"Joe, are you sure they stabilized this roadbed? . . . Joe?"

bearing strengths. When wet, however, the soil structure expands considerably and much, if not all, of the bearing strength is lost. If two percent of phosphoric acid is added, a hard, durable mass is produced.

To next page

specialization assures a finer product

## FLOWLINE WELDING FITTINGS

Stainless Steels · Monel · Nickel · Aluminum

... made by specialists  
in corrosion-resistant metals



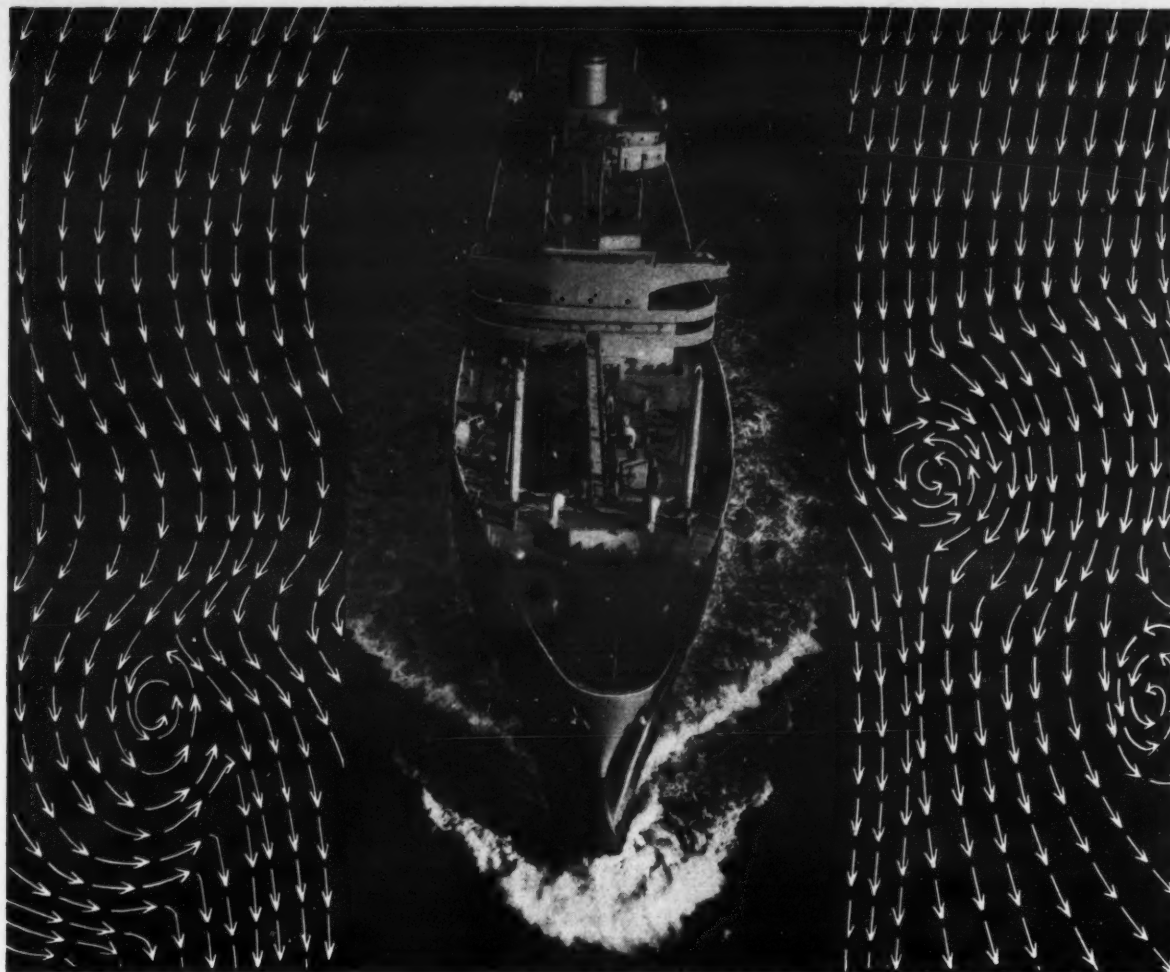
FLOWLINE fittings are engineered to meet the toughest conditions in corrosive environments. The exclusive method used produces a uniform crystalline structure with no weld metal joints — a process which puts the metal in the best condition for corrosion resistance. The mechanical specifications of FLOWLINE fittings exceed requirements of applicable A.S.T.M., A.S.A., and M.S.S. codes — giving you plus values at an extra cost.

Make your corrosion proofing job right, with FLOWLINE fittings. Full size standard and extra large fittings in stainless steel, nickel, monel, and aluminum. Available from stock through leading distributors. Sizes in stock 1/2" through 12" — Standard 50, 100, 200, 300 — Special Types 304, 304L, 316, 316L, 321, 321L, Monel, Nickel, and Aluminum.

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than  
ordinary  
fittings

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NEW CASTLE, PENNSYLVANIA  
World's Largest Manufacturer  
of Stainless Welding Fittings

Check 1738 opposite last page.



## "HEADWAY"... PETROLEUM and TANKERS

Construction of the Maumee—first of the new T-5 tankers to report for duty in the Military Sea Transportation Service—carries on the tradition of Sun Ship service to marine transportation of petroleum.

That tradition began forty years ago with the first ship launched from Sun's ways—the 80,000-barrel tanker Chester Sun. In the four decades since that launching, approximately 400 tankers built by Sun have proved their worth in peace and war. Among them was the first all-welded

sea-going tanker. Those years have brought, too, an increase in the size of tankers; capacities up to 700,000 barrels are built today.

Sun Ship facilities have grown steadily with the industry . . . serve many companies both in construction of tankers and in construction of land facilities. Sun will continue to hold that pace . . . to maintain its role in service of the industry which means so much to America . . . and to the world.

**Sun**  
**SHIPBUILDING & DRY DOCK COMPANY**  
 ON THE DELAWARE **SINCE 1916** CHESTER, PA.

Check 1739 opposite last page.

## THAT'S INTERESTING

### Paint picks out hot spots

A chameleon paint is aiding process engineers at many of Esso's refineries. This seemingly fickle product is normally dark blue and turns white if temperature of surface to which it is applied exceeds 580°F. Now "hot spots" on reactor shells can be easily spotted before trouble becomes serious. (*The News, Esso Research and Engineering Co.*)

### View from above

A big help in maintaining known reserves of essential mineral deposits is aerial color photography. Air survey teams use high-altitude photographic techniques to obtain color photos that can be examined in three dimensional viewing equipment. Geological characteristics can be observed which aid in pin-pointing oil and mineral deposits.

### Versatile detergent

No one is willing to say that this is a good "clean" method of vapor-phase chromatography, but all the ingredients are there. Proctor & Gamble's "Tide" has been found to be a useful column packing. Size and shape of granules provide a low pressure-drop through packed column. Special granules prepared without perfume and other volatile additives are used.

### Fat head?

Specific electrical conductivity of fat as compared to muscle can be used to determine depth of layers of each on a live animal. Method earned US Patent No. 2,763,135. Immediate application would be to let livestock men evaluate "quality" of animals "on the hoof" accurately. (*D & O News, Dodge & Olcott, Inc.*)

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# chemical processing®

with which is combined  
**CHEMICAL PROCESSING PREVIEW**  
and Chemical Business

**For the management team**

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November 1957

No. 11

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This issue of **CHEMICAL PROCESSING** magazine distributed to more than 48,500 members of the Management Team, wherever chemicals and chemical processes are involved:

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Industrial inorganic & organic chemicals (acids, alkalis, plastics, synthetic fibers, explosives, etc.)  
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Soap & cleansing products  
Paints, varnishes, lacquers  
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Fertilizers

Animal & vegetable oils & fats  
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Paper & allied products  
Petroleum, coal, coke-oven products  
Rubber products  
Stone, clay & glass products  
Atomic energy establishments

## Other industries utilizing chemicals or chemical processes

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Textile dyeing & finishing  
Leather tanning & finishing  
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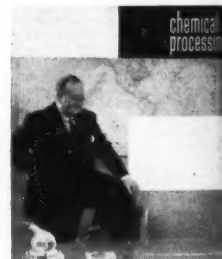
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## THIS MONTH'S COVER

Henry H. Reichhold, President and General Manager, Reichhold Chemicals, Inc., is shown at his desk — with a server shaped like the well-known Reichhold retort symbol in the foreground and a map showing the world-wide RCI operations in the background.

Mr. Reichhold tells why he thinks a chemical company should not enter the consumer field — mentions how his own company once was tempted to enter the phonograph record field. However, the decision was not to do so and he feels it was the right one. See article starting on page 30.



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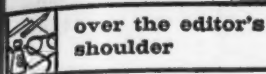
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over the editor's  
shoulder



### Invest in safety

... and you make a safe investment. In fact, an effective safety program, regardless of cost, is one of the best investments chemical management can make.

This point is clearly made in the story that opens this month's Safety Section (page 202). Here you will see why a company's management team decided to invest in a fire protection system. Have they made a poor investment? You bet they haven't. The system may never be put to actual use but, if the occasion ever arises, valuable equipment and lives will be saved. This knowledge is the dividend that company is collecting from its investment.

Safety, and the investment in safety, is the concern and responsibility of everyone, from the top man all the way down the line. That's why there is the Safety Section in each month's CHEMICAL PROCESSING. Here you will find ideas and products to help guide your making good investments.

But the Safety Section isn't the only place where you will find stories on safety. Plant stories in the other sections describe safety techniques practiced by companies. CP editors on visits to these plants always keep their eyes open for good safety operations. Presenting the safety "angle" in any plant or process story is always as important as listing the figures on costs, capacities, efficiencies, etc.

Also look through the stories about new product developments. Safety features are often pointed out in these. The New Literature Section lists bulletins, books, and pamphlets concerned with safety.

Every CP editor considers safety reporting an important part of his job.

*George V. Michael*

ASSISTANT EDITOR

Outperforms other valves under SEVERE chemical conditions

## GRINNELL- SAUNDERS DIAPHRAGM VALVES



Backing Cushion

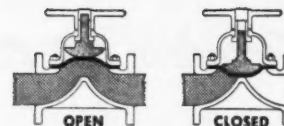
with TEFLON Diaphragms...

Grinnell Teflon Diaphragms are made by a special process which produces a better product of greater density, toughness and flex life.

The four case histories cited below demonstrate that Teflon offers a very high degree of chemical inertness to some of the most difficult chemicals which industry today must handle. Yet these are only a few of many success stories in the Grinnell files.

Diaphragm life depends on temperature, pressure and frequency of operation. Inquiries must include complete service data to receive prompt and careful attention.

Service Conditions	Saunders Valve Now Used	Service Life	
		Teflon Diaphragm	Previous Valve
Case 1. Benzene hexachloride (30%-40% benzene, free chlorine); 120 to 130 F, 10 to 20 psi; operated 3 to 4 times daily	Glass lined bodies; Teflon Diaphragm; 1 to 3 inches	10 to 14 mos.	1 to 2 mos.
Case 2. 90%-95% HNO <sub>3</sub> plus 1.8% HF (specific gravity 1.62-1.77) 115 F in summer; 40 F in winter; 125 psi; operated 2 to 3 times daily	Durimet 20 body; Teflon Diaphragm; 1 to 3 inches	8 months	2 months
Case 3. AlCl <sub>3</sub> +2 complex; ambient to 220 F; 0-50 psi; operated 1 to 2 times daily	Glass lined bodies; Teflon Diaphragms; 1 to 4 inches	9 months	6 months
Case 4. Sulphuric acid 85%; outside temperature; no pressure; operated 4 times daily	Iron bodies; Teflon Diaphragms; 2 1/2 inches	Still in service after 1 year	3 weeks



### Features of Grinnell-Saunders Diaphragm Valves

- Diaphragm lifts high for streamline flow in either direction.
- Resilient diaphragm assures positive, leak-tight closure even with grit or scale in the line.
- Diaphragm absolutely isolates working parts from fluid . . . sticking, clogging, contamination, corrosion eliminated.
- Body, linings and diaphragm materials to suit service conditions.
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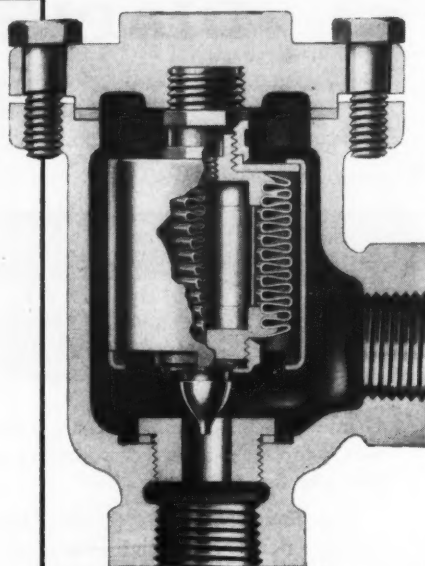
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# Proven by performance!

All departments agree on operating efficiency of SARCO Thermostatic Steam Trap

	MAINTENANCE	PURCHASING	STORES
1. Same head and seat for 0-300 psi—no changing of heads and seats for varying loads and pressures.	✓	✓	✓
2. Fewer parts to stock—same bellows, head and seat for 0-300 psi.		✓	✓
3. Greatest capacity per dollar cost—1" size discharges 9,650 lbs/hr at 10°F below steam temperature, 125 psi.		✓	
4. Very compact and light—¾" size fits in palm of the hand. Weighs only 3¾ lbs.	✓		
5. Freeze-proof—wide open, self-draining when cold.	✓		
6. Only one working part—the thermostatic element. Can be inspected or replaced in few minutes without moving trap from line.	✓		



## SARCO

Balanced Pressure  
THERMOSTATIC STEAM TRAP

Same seat and head  
for all pressures to 300 psi  
Sizes ½" to 2"

Write for Bulletin 250

## Proven by testing!

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STEAM TRAPS • TEMPERATURE CONTROLLERS • STRAINERS • HEATING SPECIALTIES

Check 1742 opposite last page.



over the reader's  
shoulder

### Sugar-coated Issue?

Dear Sir:

Re: Mr. Foy's article [on why management is not reaching unions, why cotton-candy the issue with words? It is a well known fact from an economist's point of view that prosperity will only flourish when money is given freely to individuals that tend to keep money in circulation. Who is more likely to keep money idle, the executive at \$36,000 per year, or a laborer at \$5,000 per year.

The more an employee has to spend—the better prosperity. As long as unions are the mouth-piece for individuals who separately have no voice with management for fair play and fair cost of living salary the union will enjoy the "guardian angel" roll. A company with no union policy, that favors "fair haired boys" without a look to possible potential for personal development of a man from "seniority rank", will never compete with Unions who promote fairly and can see that employees get fair share of company profit in wages.

M. B. W.

Pittsburgh, Pennsylvania

### The Water Issue

Dear Sir:

The authoritative article by Mr. Albert G. Fiedler in your issue of September 1957 focuses attention on an important natural resources problem of the Nation—namely, the rapidity with which the limit of water supply from underground sources is being approached in some areas in the country. Three representative critical areas are described with special emphasis on industrial and municipal water-supply problems. Many other problem areas could be cited. It is worth mention that not all our water problems are local or restricted to ground water. The country-wide situation, though not alarming, certainly is a cause for earnest concern. More and more our

... Notes and  
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Orchids

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NOVEM

CHEMICAL PROCESSING

...Notes and comment  
from our readers

agencies in the Department of the Interior, in order to achieve maximum realism in study, planning, and development work, are treating total water supplies, whether on or under the ground surface.

Probably you have seen a recent announcement by this Department that, in recognition of Mr. Fiedler's long and distinguished service as Assistant Chief of the Ground Water Branch of the Water Resources Division, he was promoted to Assistant Chief of the Water Resources Division in the Geological Survey. His outstanding administrative and professional talents, therefore, are now being applied to the whole field of water-resources investigations by that agency.

HATFIELD CHILSON

Under Secretary of the Interior  
US Department of the Interior

Orchids

Gentlemen:

... you may wish to know that I consistently derive great benefit and valuable information from your publication. I have received it for some time and hope to be able to continue to do so.

GEORGE F. JENKINS

American Nuclear Society  
New York

The editors of **CHEMICAL PROCESSING** Magazine are always interested in the opinions of our readers, and will publish as many letters as possible in these columns. Address your letters to:

John C. Vaaler, Editor

CHEMICAL  
PROCESSING

Magazine

111 East Delaware Place  
Chicago 11, Illinois



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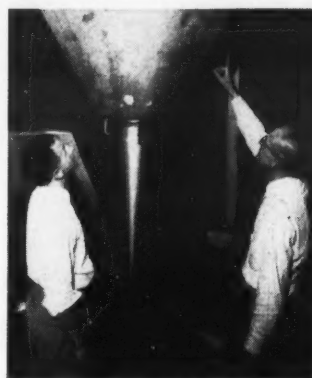
**looking ahead  
to next month**

**Quick previews of some  
highlights in December  
Chemical Processing**

## Spray drying sulfite liquor

Getting rid of sulfite waste liquor continues to be a problem for paper mills. Some burn it, some dump it, some sell it or give it away for further processing. But it's no cinch for the processor.

Robeson Process Company in Erie, Pa., gets its liquor



E. A. Eiswerth (right), Robeson's Plant Superintendent points out to Associate Editor Meinhold some design features on the company's sulfite waste liquor spray dryer

from nearby Hammermill Paper Company. Some of the low-pH material raises real havoc with equipment.

Boasting the first installation of its kind in the US, Robeson not only solved the corrosion problem but improved its product as well by spray-drying the material.

Associate Editor Ted Meinhold visited the plant and together with Robeson's President Asgeir Riis tells you the whole story in December's New Solutions section.

## The short work week — how far in the future?

Talk about the shorter work week isn't just talk anymore . . . it's reported to be one of the major questions to be considered when the Auto Workers' contract is negotiated in Detroit next year. But what about the short work week

in the chemical industry?

Next month, O. A. Knight, President of the Oil, Chemical and Atomic Workers, reveals his thoughts and the thoughts of his union concerning the shorter week . . . when, how, and why a reduction in the working hours. An up-to-date report on this vital subject.

## Higher quality for stearates

Witco Chemical wanted to improve uniformity and size standards for its line of stearates. When conventional grinding wouldn't give a product with particle size distribution in the lower micron ranges, its engineers started looking at other systems. And the search brought the desired results.

Assistant Editor Ted Wett visited Witco and talked with Plant Manager Leonard Wood in Chicago. In next month's Processing Equipment section, Editor Wett reports on the "problem-solver" . . . a superfine pulverizer that combines air attrition and impact to obtain uniform, fine grinding of heat-sensitive stearates without using any external cooling.

## Research for small firms

How can the small company with a limited budget afford the "luxury" of modern research facilities? In **CHEMICAL PROCESSING** for December, Dr. Haldon A. Leedy, Vice President and Director of Armour Research Foundation, Chicago, tells how even the smallest company can have access to the best scientific and engineering talent and equipment at relatively low cost.

According to Dr. Leedy, cooperative research is the key to a low-cost research program. He explains how and where programs are carried out, how individual projects are handled, and discusses the growing popularity of cooperative research.

**CHEMICAL PROCESSING**



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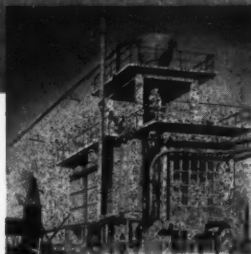
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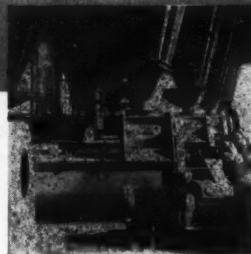
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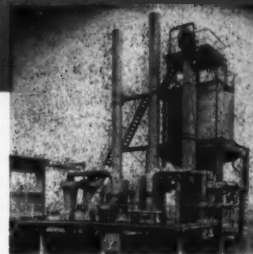
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# POWELL—the most complete line of Alloy Valves\* for Corrosive Services



Fig. 2194—Small Ni-Resist. O.S. & Y. Gate Valve for 225 W.O.G. Larger sizes, flanged end, and swing check valves in Ni-Resist also available.

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Your local valve distributor will be glad to tell you all about them. If none is near you, write to us for the full facts on Powell Valves and Powell Engineering Service.

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*\*Powell Alloy (Corrosion Resistant) Valves are available with screwed or flanged ends. Flanged end valves conform to latest standards.*



Fig. 1832—Stainless Steel Gate Valve for 200 W.P. Screwed-in bonnet, inside screw rising stem, solid wedge disc.

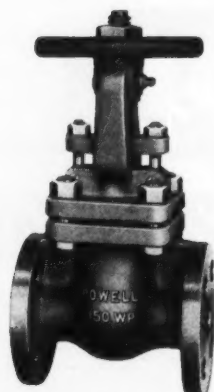


Fig. 2491—Stainless Steel Gate Valve for 150 W.P. Outside screw rising stem and yoke, solid wedge disc. Can be supplied with interchangeable split wedge disc.

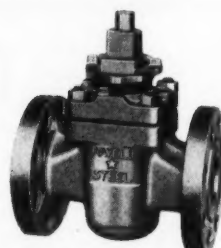


Fig. 1559—Steel Lubricated Plug Valve for 200 W.O.G. Screwed gland type. 6" and larger valves can be furnished for gear operation.



Fig. 2433SS—Large size Stainless Steel Swing Check Valve for 150 W.P. Bolted Cap.

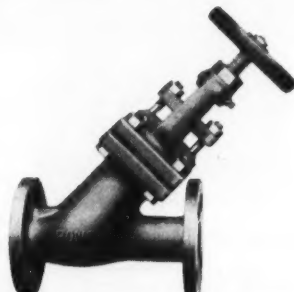


Fig. 2107—Stainless Steel "Y" Valve for 150 W.P. Plug type disc. Face to face and end flange dimensions conform to latest standards.



Fig. 1893—Large O.S. & Y. Gate Valve for Paper Mill Service. 3% Nickel Iron Body, bonnet, yoke; stainless steel stem, screwed-in seat rings; Ni-Resist wedge.

Check 1746 opposite last page.



conventions  
and exhibits

November 2-8. Second World Metallurgical Congress sponsored by American Society for Metals, International Amphitheatre, Chicago.

November 4-6. National Paint Varnish and Lacquer Association, annual convention, Sheraton Park and Shoreham Hotels, Washington, D. C.

November 4-6. Conference on Analytical Chemistry in Nuclear Reactor Technology sponsored by the Oak Ridge National Laboratory, Gatlinburg, Tenn.

November 11. Society of Plastics Engineers, Inc., Regional Technical Conference on Plastics for Airborne Electronics. Ambassador Hotel, Los Angeles.

November 11-14. American Petroleum Institute, meeting, Conrad Hilton Hotel, Chicago.

November 12. Synthetic Organic Chemical Manufacturers Association, luncheon meeting, Hotel Roosevelt, New York.

November 12-14. National Association of Corrosion Engineers, Northeast Region, fall meeting, Penn-Sheraton Hotel, Pittsburgh.

November 13-14. Air Pollution Conference, co-sponsored by Armour Research Foundation and Midwestern Air Pollution Prevention Association, Chicago.

November 13-15. Eighth National Conference on Standards, sponsored by American Standards Association, St. Francis Hotel, San Francisco.

November 14-16. The American Society of Refrigerating Engineers, semi-annual meeting, Shoreland Hotel, Chicago.

November 14-16. American Association of Textile Chemists and Colorists, annual meeting, Hotel Statler, Boston.

November 18-21. Air-Conditioning and Refrigeration Institute, Tenth Exposition.

Meetings  
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NOVEM

... Meetings and shows of interest to the chemical processing industries

International Amphitheatre, Chicago.

November 20-21. Chemical Market Research Association and Commercial Chemical Development Association, joint meeting Shamrock Hotel, Houston, Texas.

November 26. Manufacturing Chemists' Association, Seventh Semi-annual Meeting and Winter Conference, Statler Hotel, New York.

December 1-6. The American Society of Mechanical Engineers, annual meeting, Statler and Sheraton-McAlpin Hotels, New York.

December 2-6. 26th Exposition of Chemical Industries, Coliseum, New York.

December 4. Synthetic Organic Chemical Manufacturers Association, annual dinner, Hotel Roosevelt, New York.

December 8-11. American Institute of Chemical Engineers, annual meeting, Conrad Hilton Hotel, Chicago.

December 8-11. Eastern Joint Computer Conf., Park Sheraton Hotel, Washington, D.C.

December 9-11. American Pharmaceutical Manufacturers' Association, combined mid-year and Eastern Section meeting, Waldorf-Astoria Hotel, New York.

December 9-12. Chemical Specialties Manufacturers Association, 44th annual meeting, Hollywood Beach Hotel, Hollywood, Florida.

December 10-11. Society of the Plastics Industry, 8th SPI Film, Sheet and Coated Fabrics Division Conference, Commodore Hotel, New York.

January 2-3. American Chemical Society, Division of Industrial and Engineering Chemistry, Christmas Symposium, Case Institute of Technology, Cleveland.

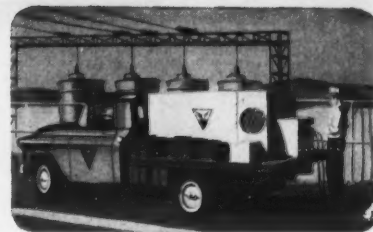
February 4-6. Society of the Plastics Industry, Inc., 13th Annual Technical and Management Conference, Reinforced Plastics Division, Edgewater Beach Hotel, Chicago.



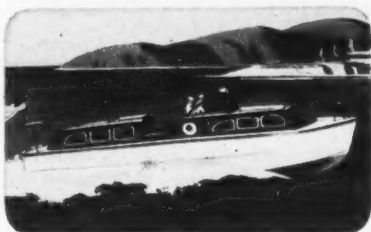
Missile Applications



Ground Support for Jet Aircraft



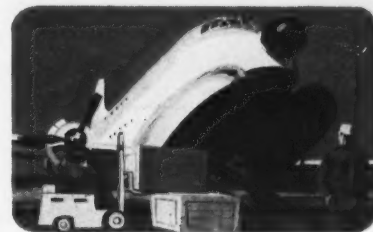
Portable Power Generation



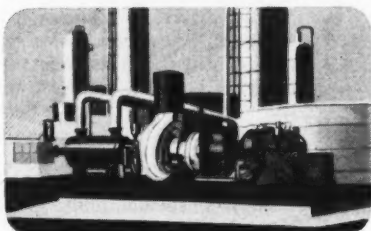
Small Boat Propulsion



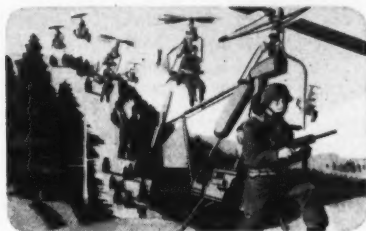
Portable Fire Pumps



Auxiliary Power for Aircraft



Turbine Drives for Process Pumps



Power for One-Man Helicopters



Emergency Stand-by Power

## Here are nine Solar gas turbine uses! Can you think of more?

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Shown above are only nine of the many uses for these new prime movers—and additional applications are limited only by the imagination. To date more than 1000 Solar gas turbines have been sold. They are serving 35 different customers in more than 50 applications. Current production models—the 50 hp Mars® and 500 hp Jupiter®—are being turned out in volume for a growing list of satisfied military and commercial users. And development work on a new 1000 hp Saturn engine is going forward.

For more than a decade Solar has been making important contributions in the gas turbine field. Whatever your business, whatever your special power needs, perhaps a versatile Solar gas turbine can provide the answer. For a new gas turbine brochure, write to Dept. D-102, Solar Aircraft Company, San Diego 12, California. *Designers, developers and manufacturers of gas turbines, expansion joints and aircraft engine, airframe and missile components.*

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Check 1747 opposite last page.





## Falls Industries is first again... with Comprehensive Data for Cost Estimation of Impervious Graphite Processing Equipment

This 32 page report presents costs and equipment specifications on all the standard impervious graphite processing equipment produced by Falls Industries. Equipment is illustrated with drawings, diagrams or photographs. Costs are tabulated in dollars per square foot of heat transfer surface, or other convenient unit.

Also covered in this report are the famous IMPERVITE impervious graphite Rupture Disk, and the IMPERVITE CROSS-BORE heat exchanger—the most recent exclusive developments of Falls Industries.

The following unsolicited comments are typical of the many received:

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reviews of current technical and reference work  
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### Ion Exchangers in Organic and Biochemistry

The fundamentals of ion exchange, the techniques and apparatus used, and the application of ion exchange to organic and biochemistry are discussed in detail by 37 experts in this 762-page book.

The editors, C. Calmon and T. R. E. Kressman, have organized this book to meet the needs of both the scientist and the technologist. The book covers the ion exchange characteristics of body tissue and cells, organisms, protein materials, special body products and fluids. Pharmaceutical and medical applications, plants and plant products, foods, organic chemistry, catalysis, and water are also covered. Details bibliographies follow each chapter.

To obtain "Ion Exchangers in Organic and Biochemistry" remit \$15.00 direct to Interscience Publishers, Inc., Dept. CP, 250 Fifth Ave., New York 1, N. Y.

Check 1749 opposite last page.

materials. However, much can be learned about the nature of synthetic high polymers through the study of their degradation. Dr. Norman Grassie has done an excellent piece of work in correlating and presenting the information in this field.

Following a brief introduction giving reaction classification and experimental consideration, there are chapters that deal with depolymerization, hydrolysis and other random chain-scission processes, oxidation, sulfuration and ozonization and non-chain-scission reactions. Emphasis is placed on rate data and mechanisms wherever possible. This 335-page book is well-written; the author has done a considerable service to persons interested in polymer chemistry.

To obtain "The Chemistry of High Polymer Degradation Processes" remit \$6.50 direct to Interscience Publishers, Inc., 250 Fifth Ave., New York 1, N. Y.

Check 1750 opposite last page.

### A Guide to the Literature of Chemistry

Chemical literature is an important part of research and development. To paraphrase the authors, literature is likened to a large mountain with a rich lode of valuable ore. The problem is how to locate and extract this material.

This second edition of a very useful book, which was the first to appear in its field back in 1927, gives a compre-

### The Chemistry of High Polymer Degradation Processes

Reviewed by HILTON A. SMITH  
Professor of Chemistry  
University of Tennessee

Numerous books have dealt with the chemistry of polymerization processes and the physical and chemical properties of the macromolecules which are formed. Until recently, the chemistry of the degradation of high polymers has been largely concerned with elucidation of the structure of naturally occurring

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# U.S.I. CHEMICAL NEWS

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## Second U.S.I. Polyethylene Plant Planned for 1958

A second plant to produce U.S.I. PETROTHENE® polyethylene will be built at a new location by National Petro-Chemicals Corporation, majority owned and managed by U.S.I. and minority owned by Panhandle Eastern Pipeline Company.

The new plant, scheduled for operation by late 1958, will produce 75 million pounds-per-year of intermediate density polyethylene resins. Capacity of the present Tuscola, Illinois plant is 100 million pounds-per-year, making the Company's total projected capacity 175 million pounds-per-year.

A modification of the conventional high-pressure process, already proved in the Tuscola plant, will be used in the new installation. Resins produced there will be of an intermediate density type, with properties somewhere between those of the original polyethylenes with which the public is familiar, and the new high-density resins produced by so-called "low-pressure" processes.

### Gulf Coast Under Consideration

Site for the new plant has not been chosen. Several Gulf Coast sites are under consideration and the Company has already optioned land at more than one location. The new plant will be constructed in a location other than Tuscola in order to assure customers of a continuing source of supply if production at either location were to be temporarily interrupted. Dual locations will also provide two separate shipping points for PETROTHENE resins, and permit even more rapid delivery to customers in some areas.

Engineering of the new plant has not waited for a final decision on location, however, and this phase of the project is already well underway. M. W. Kellogg Company is handling design and construction of the new plant.

National Petro-Chemicals is already the third largest polyethylene producer in the United States, despite its relatively short history in this field. Petro first entered the field in February, 1955 when its 26 million pound-per-year plant in Tuscola, Illinois came onstream. This was expanded in 1956 to 50 million pounds-per-year, and again in 1957 to 100 million pounds-per-year.

## New Feed Supplement for Ruminants Made by U.S.I.

A new, patented liquid feed supplement for cattle and sheep, trademarked MOREA®, will be made by U.S.I. and marketed in most states east of the Mississippi and west of the Continental Divide. U.S.I. will operate under license from Feed Service Corp. of Crete, Nebraska, which developed the product. Feed Service Corp. has been test marketing MOREA in the Midwest for the past several years.

The new supplement accelerates rumen fermentation, enabling cattle and sheep to eat and digest more feed in a shorter time. Dairy animals show improved production. Beef cattle grow faster, produce a higher quality meat than cattle raised by other

MORE

## TVA Pilot Plant Demonstrates Fertilizer Formulation with Wet Process Phosphoric Acid

High Analysis Ammonium Phosphate and Ammonium Phosphate-Nitrate Mixtures Can be Granulated Easily And Economically with Continuous Ammoniator

Pilot plant runs, conducted recently by TVA's Office of Chemical Engineering at Wilson Dam, Alabama, demonstrated new methods for making high analysis ammonium phosphate and ammonium phosphate-nitrate granular fertilizers such as 7-28-28, 17-17-17 and 15-15-15. About 400 members of the industry saw the 3-day demonstrations, in which a key role was assigned to wet process phosphoric acid.

Most of the demonstrations were carried out in TVA's continuous ammoniator, in some cases with auxiliary equipment. This type of ammoniator is simple and has found extensive use in industry. It can be employed to make a wide range of grades from a variety of raw materials, including phosphate rock, the superphosphates, and many of the materials produced by U.S.I.—wet process phosphoric acid, anhydrous ammonia, nitrogen solutions, ammonium nitrate, and sulfuric and nitric acids.

Wet process phosphoric acid was used in preparing all ammonium phosphate and ammonium phosphate-nitrate mixtures shown in the table below, which summarizes data published by TVA.

Granulation of a number of grades was accomplished better with wet process acid than with electric furnace acid. Excellent granulation in high nitrogen products was achieved with wet process acid, to which a

small amount of iron ore form had been added.

Granules of the products were generally spherical and quite hard. Bag-storage and open bin bulk-storage test results were favorable.

### Wet Process Acid Economical

Also of prime interest at the demonstrations were studies prepared by TVA indicating that high analysis granular mixtures made with wet process phosphoric acid may be produced at lower cost than conventional fertilizers. This was shown specifically for several grades, using raw materials costs believed typical for a midwestern location.

Other highlights of the demonstrations included manufacture of high analysis mixed goods using diammonium phosphate, superphosphoric acid, and electric furnace phosphoric acid; manufacture of nitric acid phosphates, granular normal superphosphate, granular triple superphosphate, granular enriched superphosphate, and granular no-nitrogen grades.

TVA FORMULATIONS FOR AMMONIUM PHOSPHATE, AND AMMONIUM PHOSPHATE-NITRATE FERTILIZERS UTILIZING WET PROCESS PHOSPHORIC ACID

Material	Grade	17-17-17	15-15-15	11-22-22	16-48-0	8-16-32	7-28-28
Phosphoric Acid, Wet Process	75% H <sub>3</sub> PO <sub>4</sub>	625	425	809	1767	589	1031
Ammoniating Solution *	—	826 (2.7)	481 (2.7)	541 (X)	742 (X)	362 (X.6)	—
Anhydrous Ammonia	—	—	—	—	275	—	173
Ammonium Sulfate	20.5% N	—	500	—	—	—	—
Sulfuric Acid	93% H <sub>2</sub> SO <sub>4</sub>	112	—	—	—	—	—
Potassium Chloride	60% K <sub>2</sub> O	567	500	733	—	1067	933
Concentrated Superphosphate	46% P <sub>2</sub> O <sub>5</sub>	—	150	—	—	—	—
Iron Ore	—	—	—	—	—	20	—
Filler	—	—	—	51	—	—	—
Conditioner	—	44	53	80	88	84	52
Recycle	—	4500	2000	2500	7000	1500	2000

\* COMPOSITION OF AMMONIATING SOLUTIONS, %

(U.S.I. Designation)	TVA Designation	Free Ammonia	Ammonium Nitrate	Ammonium Carbamate	Water	Total N
(1)	X	22.2	65.0	0	12.8	41.0
(10)	X.6	25.0	69.0	0	6.0	44.8
(2)	Y	26.2	55.5	0	18.3	41.0
(12)	Z.7	19.0	74.0	0	7.0	41.4



# U.S.I. CHEMICAL NEWS

## CONTINUED Supplement

feeding methods (more marbling with less waste fat).

MOREA is a liquid mixture containing urea, ethanol, phosphoric acid, essential trace minerals and molasses. U.S.I. will sell a concentrated liquid MOREA premix to feed manufacturers who will blend the concentrate with molasses. The company is currently appointing manufacturers who will mix and distribute the final MOREA product to feeders. U.S.I. is a basic producer of ethanol and phosphoric acid which are both in the premix.

## X-rays Measure Hafnium In Zirconium Samples

Small amounts of hafnium in zirconium samples can be determined by means of X-ray fluorescence, according to two members of the Faculty of Science of Paris. After a sample is bombarded with X-rays, an aluminum monocrystal and a Geiger counter measure the intensity of the resulting characteristic spectrum of hafnium.

More precise measurements may be obtained by monitoring part of the beam from the X-ray tube with a tantalum sample and an auxiliary counter. A hafnium content of about 0.016% can be detected in this way.

## Come to the "Atomfair"

The 1957 Trade Fair of the Atomic Industry is being held at the New York Coliseum from October 28-31. The Fair is being staged in conjunction with the Atomic Industrial Forum's annual atomic industry conference; the Winter meeting of the American Nuclear Society; the first major unclassified Reactor Safety Conference; the second conference on Careers in Nuclear Science & Engineering; and the annual meeting of the Professional Group on Nuclear Science of the Institute of Radio Engineers.

Look for U.S.I. in Booths 117-118.

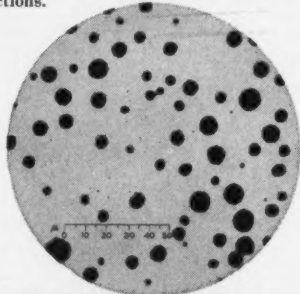
## Sodium Dispersions May Be Key to Lower Cost Acetylacetone Production

The use of sodium dispersions as a catalyst for production of acetylacetone may permit substantial reductions in production costs, according to recently reported experimental work. Yields are higher, and reaction time much shorter, than with processes using sodium alkoxide or small pieces of metallic sodium. Also, the hazards involved in producing acetylacetone by the sodium alkoxide route are minimized when sodium dispersions are used.

In the experiments reported, sodium dispersions in toluene and xylene were added to mixtures of acetone and methyl acetate with the medium-boiling hydrocarbons as diluents. The dispersion samples used were obtained from U.S.I. The reaction was carefully controlled. Acetic acid and ethyl acetate were used to separate and extract the acetylacetone. On distillation under vacuum, a water-white, acid-free acetylacetone of 97 to 99% purity was obtained.

Total reaction time was about two hours, as compared with 24 hours with small pieces of sodium and 40 to 50 hours with sodium alkoxide.

A recently published 42 page booklet entitled "Sodium Dispersions" is available from U.S.I. to those interested in using sodium in dispersed form for this or similar reactions.



Photomicrograph of typical sodium dispersion, with most particles of 2-15 microns diameter.

## TECHNICAL DEVELOPMENTS

Information about manufacturers of these items may be obtained by writing U. S. I.

**A new polyvinyl acetate resin emulsion adhesive**, compatible with dextrine adhesives, is designed for high-speed case and carton sealing. Adhesives can be changed without shutting down machine to clean glue box. **No. 1281**

**Proteins and amino acids in animal nutrition** are discussed in detail in a revised, up-to-date booklet. Included are such subjects as Mutual Supplementary Action of Proteins; Relation of Amino Acid Requirements to Protein Level. **No. 1282**

**Electronically heat-sealable vinyl gravure inks** in a wide range of colors are currently being produced. Prints for automotive upholstery have been heat-sealed without destructive arcing sometimes found in conventional inks. **No. 1283**

**An atomic reactor** is being made with a polyethylene moderator. Can be used for applied research, radiation testing, a wide range of educational purposes—such as training of reactor operators. Said to be versatile, inexpensive. **No. 1284**

**A differential pressure liquid level transmitter** mounted directly on a tank nozzle measures viscous or slurry-type liquids in open or closed vessels. It uses a force balance principle, can operate a remote indicator or recorder. **No. 1285**

**A bright new B-O-N type red pigment** has a bluish shade, good light and bleed resistance. Can be used alone or with other colors for a variety of shades. Said to be lower in cost, easier to grind. **No. 1286**

**Polyethylene ware** for laboratories and clinics is described in a new 8-page bulletin. Items available include beakers, aspirator bottles, tubing, pipet-fillers, vials, carboys. **No. 1287**

**A new synthetic gum** is said to be an excellent binder that dissolves in water or alcohol to give non-viscous solutions, even in high concentrations. Requires no preservative, being self-active as bactericide or germicide. **No. 1288**

**A new hydrophobic lanolin derivative** with good solubility and solubilizing properties is said to be valuable for aerosols, shampoos, suntan and sunscreen preparations, and powders and talcs. **No. 1289**

**Fire extinguishers** are described in a new buyers guide. Information is given on dimensions, discharge ranges, laboratory approvals and classifications, and other construction data for portable fire-protection equipment. **No. 1290**

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**Sodium Sulfate**

**Sulfuric Acid:** all strengths, 60° Baumé to 40% Oleum. Also Electrolytic grade to Federal specifications. Tank cars or tank wagons.

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**Nitrogen Fertilizer Solutions**

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**Animal Feed Products:** Calcium Pantothenate, Choline Chloride Products, Curbay B-G® 80, Special Liquid Curbay®, DL-Methionine, Niacin USP, Riboflavin Concentrates, Vitamin B<sub>12</sub> and Antibiotic Feed Supplements, Vacatone® 40, Vitamin D<sub>2</sub> and K<sub>2</sub> Products, Antioxidant (BHT) Products, Special Mixes, U.S.I. Pernadry Products (Sealed-In Vitamin A).

**Pharmaceutical Products:** DL-Methionine, N-Acetyl-DL-Methionine, Riboflavin USP, Urethan USP, Intermediates.

**Metals:** Titanium Sponge, Zirconium Sponge, Zirconium Platelets, Hafnium Oxide, Hafnium Sponge.

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hensive, up-to-date coverage of this field. It is intended to be used both as a reference work and a text.

In 398 pages, the volume tells how to get the most from books, periodicals, patents, government publications, trade literature, indexes, libraries, and other sources such as theses, unpublished material, organizations, and correspondence.

Procedures to use in literature searches are described. A 70-page appendix lists abbreviations, libraries, periodicals, scientific and technical organizations, and dealers and publishers.

To obtain "A Guide to the Literature of Chemistry, 2nd Ed." remit \$9.50 direct to John Wiley & Sons, Inc., Dept. CP, 440 Fourth Ave., New York 16, New York.

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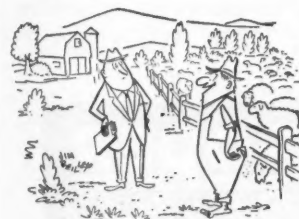
## Epoxy Resins

### Their Applications and Technology

Burgeoning epoxies have not only replaced conventional plastics in many applications, but they are moving into fields previously invulnerable. Many technical and design men are confronted with a thermoset about which they are unfamiliar.

Here in one 306-page text, Henry Lee and Kris Neville of The Epoxylite Corp., have

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"...and I'd like to order one of them hydraulic rams!!!"



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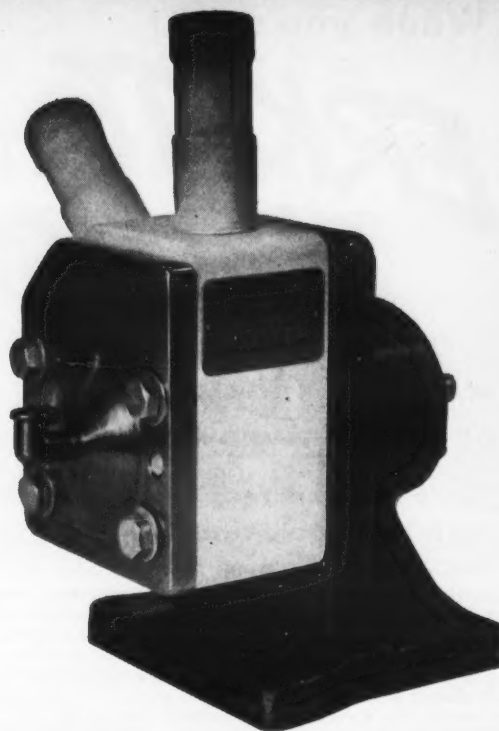
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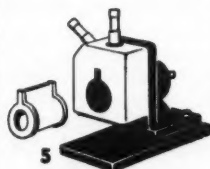
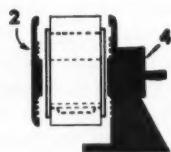
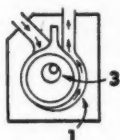
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Now at last, here's a pump to solve for good your problems of pumping corrosive or abrasive liquids or slurries! HCl, caustics, TiCl<sub>4</sub>, even fuming HNO<sub>3</sub> and fuming H<sub>2</sub>SO<sub>4</sub> (oleum), all yield to the combination of Vanton's unique pump design with *Teflon* and *Kel-F\*\* elastomer*, the outstanding new fluorocarbons that remain unaffected by even aqua regia!

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All Vanton pumps are self-priming, high-vacuum, and available in a broad range of capacities from 1/2 to 40 g.p.m. In addition to Teflon, they are obtainable in 7 body and 10 flex-i-liner materials, including polyethylene, Buna N, hypalon, Kel-F, etc.

\*TEFLON—Reg. trade-mark of Du Pont for its tetrafluoroethylene resin.  
\*\*KEL-F—Reg. trade-mark of Minnesota Mining & Mfg. Co.

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## RECENT BOOKS

provided theoretical and practical information on the epoxy resins. Here's what they discuss: synthesis and characterization; curing, and curing agents; diluents, fillers, and resinous modifiers; plasticizers and flexibilizers; casting, potting, encapsulation, sealing, and lightweight foams; adhesives; laminates; coatings; and handling methods and safety precautions.

Much tabular and graphic data are included.

To obtain "Epoxy Resins: Their Applications and Technology" remit \$8.00 direct to McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36, N. Y.

## Biological Treatment of Sewage and Industrial Wastes

Reviewed by JOHN E. RICE  
Chief Chemist  
District of Columbia  
Sewage Treatment Plant

Volume I of this series, "Aerobic Oxidation," consists of 393 pages devoted to aerobic treatment of organic wastes.

In preparing this volume, the editors, Brother Joseph McCabe and W. W. Eckenfelder, Jr., have followed a popular trend in grouping 33 papers originally presented by 44 authors at the first Conference on Biological Waste Treatment held at Manhattan College in April 1955. These are divided into four principal sections: 1) Theory and Mechanism of Biological Waste Treatment, 2) Aeration Theory and Design, 3) Sewage Treatment, and 4) Industrial Waste Treatment.

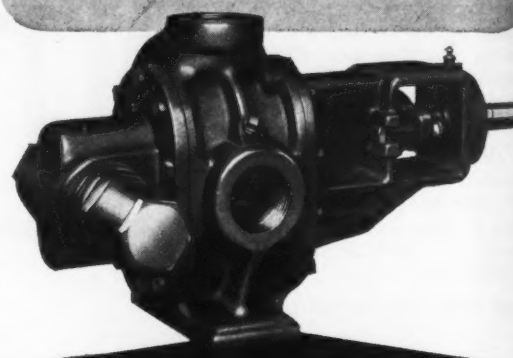
Arrangement is good and presentation is generally effective. There is good diversity of viewpoint and some refreshing approaches to basic problems in aerobic waste treatment. Each of the four sections has an adequate bibliography.

There is a tendency to rely on references to other publications as a substitute for detailed introduction to the sub-

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CHEMICAL PROCESSING

ject matter in a number of the separate papers. In most cases this is not a serious fault, but many readers would prefer more detail in the opening paragraphs. Similar comments apply to some of the mathematical expressions used, where more complete identification of terms would aid in immediate comprehension. Brevity is a virtue in today's copious literature, but a few explanatory statements would add much to numerous passages.

Printing and binding are good. The few errors do not detract from the value of any portion of the text. Those readers concerned with design and operation of aerobic waste treatment facilities will find much of interest in this volume. Invertebrate experimenters, in both plant and laboratory, will be challenged and stimulated by many of the statements that are made.

To obtain "Biological Treatment of Sewage and Industrial Wastes — Vol. 1, Aerobic Oxidation" remit \$10 direct to Reinhold Publishing Corp., 430 Park Ave., New York 22, New York.

### Standard Mathematical Tables Eleventh Edition

The size of the handbook is still the same (5 x 8 x 1" thick), but the editors have added even more mathematical information than that included in the previous edition published three years ago.

In addition to logs, functions, squares, integrals, etc., which are still the standbys of engineers and scientists, the editors have added differential equations, and Fourier series and transforms, and have extended the tables on factors and primes, partial fractions, and many special tables related to statistical and trigonometric work.

The handbook has 480 pages.

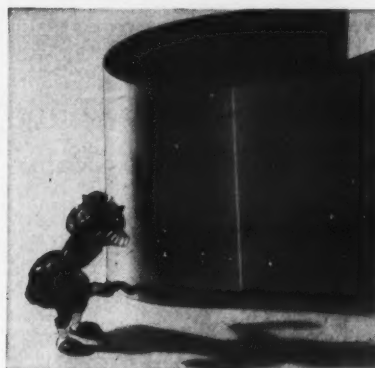
To obtain "Standard Mathematical Tables, 11th Ed." remit \$3.00 direct to The Chemical Rubber Co., 2310 Superior Ave., Cleveland 14, Ohio.

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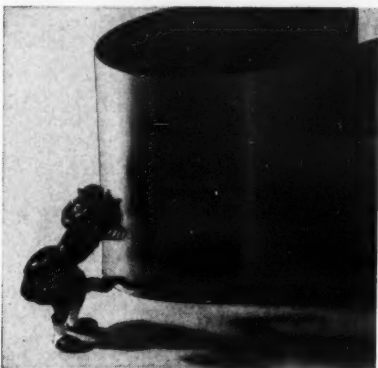
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## RECENT BOOKS

### Selection of Management Personnel

An important feature of this boxed two-volume, 906-page report on selection methods for management personnel are the 19 detailed case studies of actual company practices. Specific testing, interviewing, and merit-rating methods of companies such as Monsanto Chemical Company, American Smelting and Refining Company, and General Motors Corporation are explained.

Edited by M. Joseph Dooher and Elizabeth Marting, over forty leading management experts discuss practical aspects of executive and supervisory selection as: defining the job and its requirements, assuring enough candidates, and making the most of available tools and techniques.

Using an approach that is generally applicable, this valuable reference work defines the essential nature of the manager's job, identifies the qualities necessary for success, and describes how managers are chosen and evaluated.

To obtain "Selection of Management Personnel" remit \$15.00 (AMA members \$10.00) direct to American Management Association, 1515 Broadway, Times Square, New York 36, N. Y.

### Glossary of Terms in Nuclear Science and Technology

A standard guide to establish precise meanings for hundreds of technical terms used in the rapidly growing nuclear field is now available. The "dictionary" which was used in preliminary draft form at the 1955 International Geneva Conference on Peacetime Atomic Energy, and at the 1957 Nuclear Congress in Philadelphia has been approved as an American Standard by the ASA.

The 188-page book is designed to provide a common language among chemists, physicists, engineers, biologists,

medical men, and others working with the various branches of the field. Those involved in those branches of the field and those who are interested in the field are included.

To obtain in "Nuclear Science and Technology" remit \$4.95 direct to American Management Association, 1515 Broadway, Times Square, New York 36, N. Y.

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medical men, and others working with the atom. Three categories of terms are included: Those invented especially for the field of nuclear energy; those borrowed from other fields and used here with different meanings; and those used elsewhere, but which may be unfamiliar to nuclear workers. Useful definitions, tables, charts, and formulas are included in the glossary.

To obtain "Glossary of Terms in Nuclear Science and Technology" remit \$5.00 direct to The American Society of Mechanical Engineers, 29 West 39th St., New York 18, N.Y.

### Polyethylene

Theodore O. J. Kresser of the Spencer Chemical Co. has prepared this 232-page handbook discussing polyethylene: What it is used for, where it is preferable to other materials, and how it is made.

It is the first book primarily concerned with the applications of polyethylene. It is also the first of a new series of books on applications of the many classes of plastic materials.

Although the bulk of the book is devoted to applications of this versatile plastic, five of the nine chapters cover history, properties, chemistry, and manufacture of polyethylene. The last chapter gives an interesting look-see into future prospects.

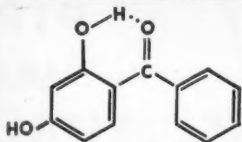
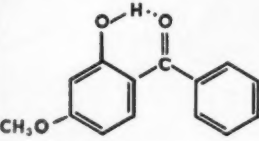
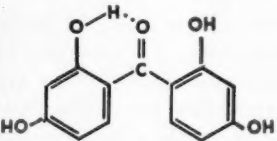
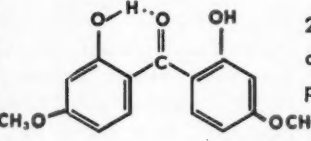
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**nuclear notes**

**Carbide begins studies with new accelerator**

Union Carbide scientists have started investigations on properties of various materials bombarded by high-energy particles from a million-volt



Accelerator being assembled at the Sterling Forest lab

Van de Graaff accelerator installed at their Sterling Forest, N.Y., laboratory. Machine will also be used for training personnel in various radiation chemistry techniques and health physics.

**Defer construction of mill for uraniferous lignites**

The Ohio Oil Company and Arthur E. Pew have notified the AEC of their decision to defer building a mill to extract uranium concentrate from lignite occurring in the western parts of North and South Dakota.

Postponement was made "pending development of improved ore processing or a greatly increased demand for uranium oxide." Process studies indicated that the proposed operation was not economically feasible at the ceiling price of \$10.50 per pound of  $U_3O_8$  contained in acceptable concentrates derived from lignite.

**Argonne awards contract for ARBOR**

A contract for the detailed design of ARBOR — a boiling water reactor facility — to be erected at Argonne National Laboratory's Idaho Division

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**Atomic reactor for oil**

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**Powerful for Sand**

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**Tubular for MTR**

Experi elements Nuclear Company, terial Tes Idaho. Th four tub assemblies contain 10 uranium two will grams of riched wi



... Significant news about atomic energy

site, was awarded to United Engineers & Constructors, Inc., of Philadelphia. Anticipated cost of the facility will be about \$8,500,000.

Completion of the design work is scheduled for May 1, 1958. Purpose of plant will be to investigate full-scale boiling water power reactor systems operating at pressures up to 2000 psi and developing 200,000 kilowatts of heat under varying conditions.

#### Atomic radiation laboratory for oil product studies

Nuclear radiation will be used in experiments designed to create or improve petroleum and petrochemical products and processes at Continental Oil Company's new laboratory in Ponca City, Okla. Source of radiation will be AEC-supplied fuel elements.

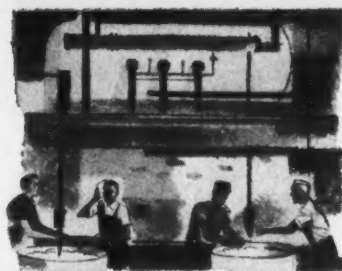
#### Powerful atom smasher for Sandia Corporation

A two-million-volt Van de Graaff accelerator has been ordered from High Voltage Engineering Corp., Burlington, Mass., by Sandia Corp., for its laboratories in Albuquerque, N. M. The \$120,000 atom smasher will be used for radiation physics and chemistry research by Sandia scientists in the testing of various materials.

#### Tubular fuel elements for MTR

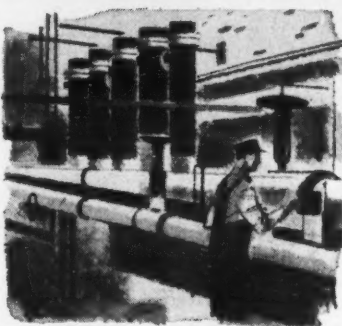
Experimental tubular fuel elements will be supplied by Nuclear Div., The Martin Company, for the AEC's Material Test Reactor at Arco, Idaho. The contract calls for four tubular fuel element assemblies. Two will each contain 1000 grams of natural uranium dioxide. The other two will each contain 1000 grams of uranium dioxide enriched with 20% U-235.

## Chromalox® Electric "Job-side Heating" for anything that's piped



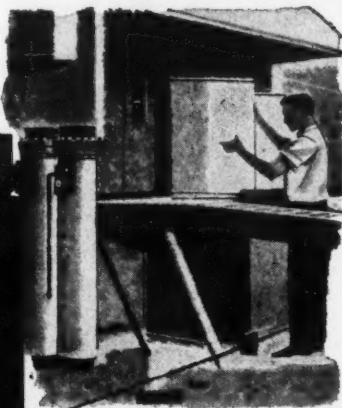
#### WATER—Factory heats water for washroom

During summer boiler shut-down, this company uses Chromalox Circulation Heaters and a ceiling-mounted storage tank to provide hot water for after-work clean up. Tapped steel mounting lugs factory-welded to the heaters made installation quick and easy. Water is heated mainly at night with off-peak power at lowest rates.



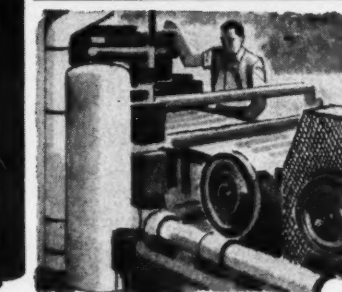
#### AIR—Aircraft factory heats air for thermodynamic testing

This nationally prominent aviation company installed seven Chromalox Electric Circulation Heaters to pre-heat air used for product testing. Four 80 kw heaters are rated for a maximum air flow of 450 lbs. per minute at 285 psi. Air enters the circulation heaters at from 90-210°F and is raised to a maximum of 900°F. Three 50 kw heaters have a maximum air flow of 250 lbs. per minute at 100 psi.



#### TRANSFER FLUIDS— Container manufacturer circulates hot oil to melt wax

As fibre drums leave this manufacturer's production line, a wax coating is applied for a smooth, grease-proof, moisture-proof interior. For a uniform coating of the desired thickness, wax must be sprayed at a constant 240°F temperature. A nozzle sprays wax up into the inverted drums as they are placed on a drain rack. As excess wax drains to a basin beneath, it is reheated and used again. The catch basin is heated by a transfer of heat from coils containing hot oil. Two 15 kw Chromalox Circulation Heaters are thermostatically controlled to keep the oil at a uniform 400°F. A separate thermostat maintains the 240°F wax temperature in the reservoir.



#### STEAM—Printing plant boosts steam temperatures to speed ink drying

A Chromalox Electric Circulation Heater is mounted alongside this press to boost steam temperature to 760° and eliminate the need for excessive boiler pressure. Although steam temperature takes a quick drop after leaving the heater, it still reaches the paper web at much higher temperatures than when the boiler alone was used and the steam had to travel a long distance.

Get the full story  
about Chromalox Circulation Heaters from  
your Chromalox Representative or write us  
direct for Bulletin 701  
and new Case Studies.



## CHROMALOX ELECTRIC HEAT

Edwin L. Wiegand Company

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Check 1761 opposite last page.

# 2880

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The complete range of 2880 combinations requires only 20 casing sizes, three frames, and four basic impeller designs. As for materials, you can select from 12 metals or a special plastic to get long life when pumping corrosive or abrasive fluids.

The high interchangeability is an important advantage made possible by the concentric casing design. Other advantages include long, trouble-free operation, low maintenance, and freedom from vibration.

You can be sure of getting prompt service, also, because Mission distributors are located in all major industrial areas. Write for full information.

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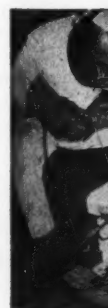


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### Temporary regulation on indemnities

The AEC has issued a temporary regulation, effective Sept. 26, 1957, designed to give immediate protection to the public and to licensees and their suppliers against losses arising from reactor accidents. The regulation, based on Public Law 85-256, will provide protection while a permanent regulation is prepared. A principal purpose of the temporary measure is to specify amounts of protection required of reactor licensees. Amounts prescribed are based on thermal energy capacity of licensed reactor, at the rate of \$150,000 per thousand kilowatts of thermal energy. In no event may a licensee have less than \$250,000 of financial protection. An electrical kilowatt is approximately 4 thermal kilowatts.

### Japanese reactor in operation

A 50-kw, solution-type nuclear reactor is now operating near Tokyo, Japan. The first in the Far East, it will be used primarily for research. Unit was built in US by Atomics International, Division of North American Aviation, Inc.

### Uranium production — first half of 1957

Statistics on domestic uranium production for the first six months of 1957 have been compiled by the Grand Junction Operations Office of the AEC. Figures cover uranium concentrate production, ore production, stockpiles, ore reserves, bonus payments, and employment figures.

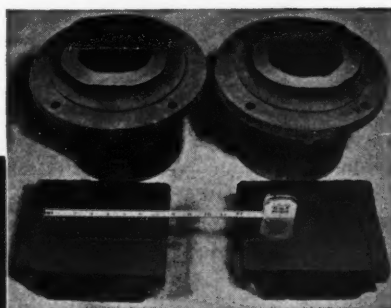
During the period, twelve uranium processing mills were operating in the western US, including one Government-owned mill at Monticello, Utah. A total of 4141 tons of uranium concentrates were received at Grand Junction. Processing plants treated about 9000 tons of uranium



## Longer Valve Life with Colmonoy Hard-Facing

Catalyst slide valve gates, throats, and bodies last up to five times longer when hard-faced with Colmonoy No. 1 electrodes. The success of Colmonoy No. 1 in resisting erosion by catalytic fluids has made it the standard material for hard-facing slide valves by many maintenance shops, job shops, and valve manufacturers.

Colmonoy No. 1 electrodes have a new metallic coating that improves arc stability, permits vertical welding, and eliminates weld cleaning between successive passes. This reduces welding time to cut the already low cost of reclaiming valves with Colmonoy hard-facing.



Two 8 inch slides and throats after being reclaimed with Colmonoy No. 1 (shown finish ground)



A valve slide being hard-faced with Colmonoy No. 1 electrodes.

Write for Colmonoy Hard-Facing Manual #79 for more about Colmonoy hard-facing alloys and methods.

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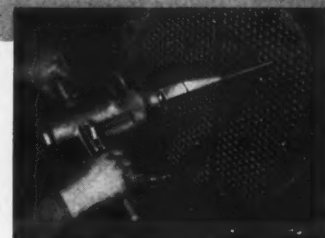
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NOVEMBER 1957

Keep Heat Exchangers on the Line with

## WILSON Maintenance Tools

### Heavy-Duty TP-301 Cleaner



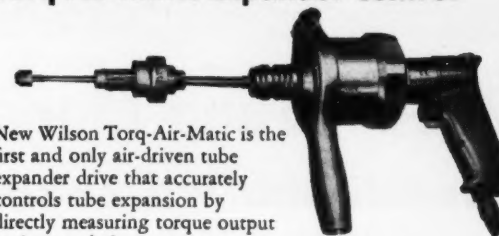
Positive air-driven, hollow rotary shaft, drill type tool. Tube is scavenged with air or water while cleaning.

### Tube Expanders



Wilson Models 41 and 44 Tube Expanders incorporate an improved, adjustable ball bearing thrust collar and are designed for efficient, easy rolling and maximum roll length adjustment for various tube sheet thicknesses.

### Torq-Air-Matic Expander Control



New Wilson Torq-Air-Matic is the first and only air-driven tube expander drive that accurately controls tube expansion by directly measuring torque output at the mandrel.

### Tube Cutter



Wilson tube cutter is easy to use and does a fast job. Cutter sizes and shanks available to meet all heat exchanger requirements.

Write today for your copies of Wilson Tube Cleaner catalog No. 77 and Wilson Tube Expander catalog No. 88.



Representatives in principal cities  
Thomas C. Wilson, Inc. • 21-11 44th Ave., Long Island City 1, N. Y.  
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# WILSON

TUBE CLEANERS • TUBE EXPANDERS

Check 1764 opposite last page.





Made at INCO'S own foundry, this cast Monel impeller is typical of the large-size castings you can obtain in Inco Nickel Alloys to resist damage from corrosion. Operators of the CALOIL refinery at Perth Amboy now standardize on Monel nickel-copper alloy for all salt water pump impellers. The 2200-pound Monel alloy unit shown here, for an Allis Chalmers salt water pump, delivers 40,000 gallons per minute at 70 psi when turning over at 500 rpm.

## 2200-pound Monel Impeller cast by Inco ...ends salt water corrosion hazard for CALOIL

If your operating conditions are rough on conventional casting materials, follow the example of The California Oil Company (CALOIL).

CALOIL takes salt cooling water from off Perth Amboy, New Jersey with two large-capacity Allis Chalmers centrifugal pumps . . . one stand-by, one operating.

Routine inspection showed one of the 2200-lb. impellers had developed signs of failure. CALOIL decided on immediate replacement . . . asked Allis Chalmers for the most durable material they could get: Monel\* nickel-copper alloy.

Monel is strong, tough — highly resistant to erosion, abrasion and

salt water corrosion. CALOIL anticipates the new impeller will last as long as the pump.

### A Source For The Tough Ones

To produce Monel alloy castings of this size takes experience. That's why Allis Chalmers turned the job over to Inco — the company that developed Monel.

Fifty years' experience in casting Inco Nickel Alloys is one reason why you, too, should make the Inco Foundry your source for the "tough ones." Inco castings stand up where

conventional castings fail. Remember, Inco specialists cast Monel, Nickel and Inconel in shapes and sizes previously considered impractical.

\*Registered Trademark

### Booklet gives details

"CAST TO OUTLAST" . . . a 16-page case-history booklet, explains how Inco Nickel Alloy castings answer severe demands in various industries. Describes properties, gives specifications and other useful data. Just write,

**The International Nickel Company, Inc.**  
67 Wall Street New York 5, N. Y.



**Castings . . . Sand, Centrifugal and Precision**

Check 1765 opposite last page.

## NUCLEAR NOTES

ores per day in the six month period.

Uranium ore receipts at all domestic plants and Government purchase depots totaled 1,706,000 dry short tons. Ore stockpiles totaled 1,946,000 dry tons and reserves totaled 67 million tons, with an average  $U_3O_8$  content of 0.27%.

Initial production bonus payments for the first six months of 1957 came to \$1,500,319. It is estimated that approximately 5500 persons were employed directly in uranium mining in the western US at the end of June 1957.

### Danish nuclear reactor begins operation

Denmark's first atomic reactor is now in operation at the new Danish AEC nuclear research center, 20 miles west of Copenhagen. The solution-type reactor was built by the US firm, Atomics International. Designed to operate at five watts, it will be used for nuclear engineering and training, radioisotope production, and research.

### Ceramic fuel element pilot plant

American Lava Co., subsidiary of Minnesota Mining & Mfg. Co., has announced plans for construction of a pilot plant for production of ceramic fuel elements for nuclear power reactors. Authorization of the pilot plant followed notification from AEC that company had been granted license to work with enriched uranium.

### Hospital gets license to operate reactor

The US Naval Hospital at Bethesda, Md., has received a license to operate a 5-watt research reactor for use in medical research, radioisotope production, and training of personnel.

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## NUCLEAR NOTES

### OK proposal for \$21 million nuclear power plant

The proposal of Northern States Power Company of Minneapolis, Minn., to design, develop, build and operate a nuclear power plant, has been approved as a basis for contract negotiations by the AEC. Total capital costs for the plant, which is scheduled for completion by June 30, 1962, will be approximately \$21 million.

### Pint-size nuclear reactor for research, training

Only eight feet high and eight feet in diameter, miniature nuclear reactor has been



Physicist inserts an experiment into core of miniature reactor

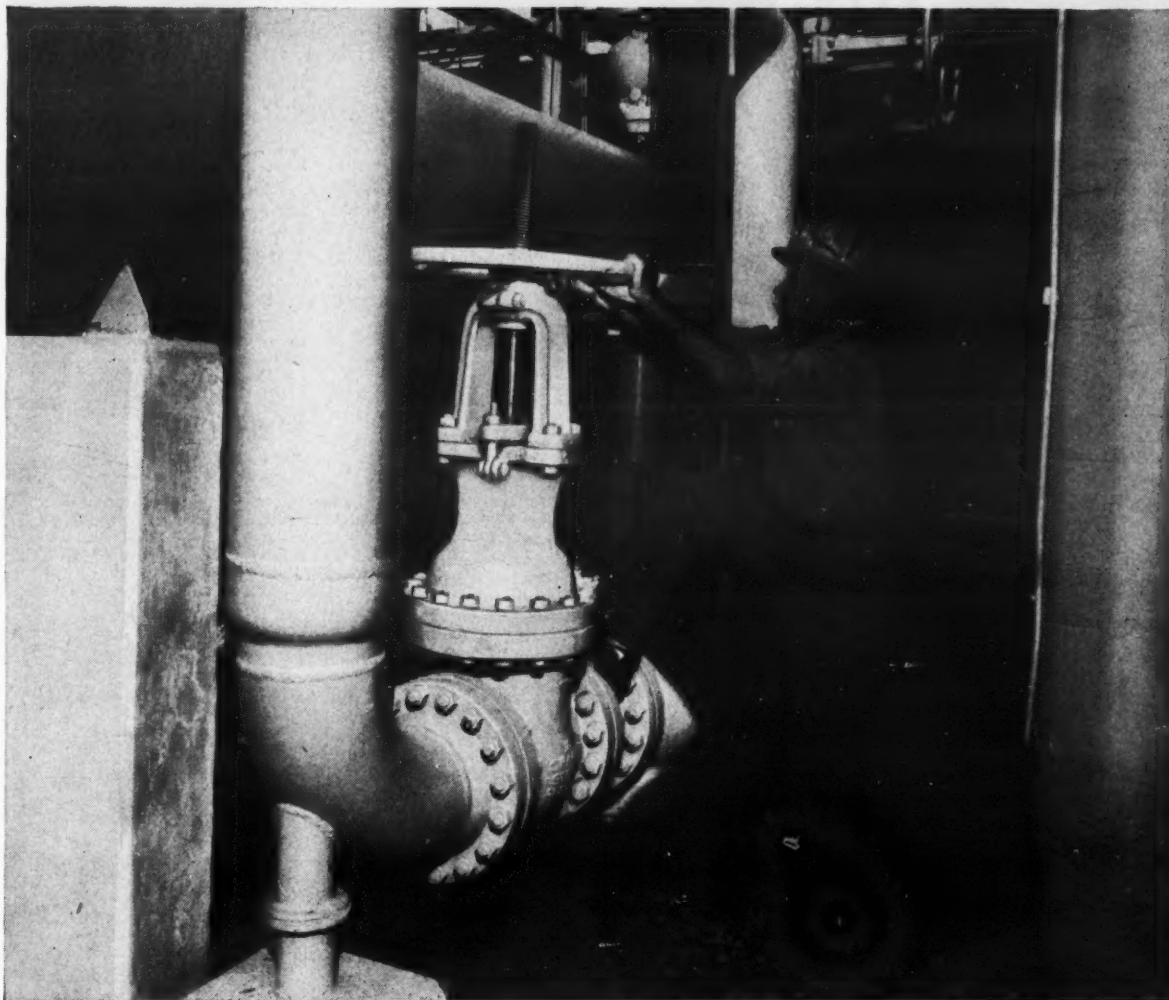
designed by Atomics International, a division of North American Aviation Inc. The reactor permits a wide range of research and training in nuclear field. It is designed to operate at power level of five watts.

Check 1766 opposite last page.

### Nuclear power division formed by company

Hagen Chemicals & Controls, Inc., Pittsburgh, Pa., has announced formation of a nuclear power division. Major function will be application of company's instruments and control methods to nuclear power reactors. Water treating methods developed by the Hall Laboratories and Calgon Divisions will be applied to water problems associated with nuclear power generation.

## CRANE Steel Valves Prove Value in Petro-Chem Processing



### Only Routine Maintenance During 13 Years on Hot Acetone

Thirteen years ago, Petroleum Chemicals, Inc., Lake Charles, Louisiana, producer of butadiene, installed Crane 33XR 10-inch cast steel wedge gate valves to handle acetone at a maintained temperature of 185°F.

Run-of-the-mill gate valves used in such service frequently are the source of serious and expensive maintenance problems.

But not these Crane valves. Installed in 1944, they have required no maintenance

beyond routine repacking of the stuffing boxes!

What makes such a difference in valve performance? In Crane valves it is the built-in ability to do the best job possible for a much longer time. That kind of performance adds up to real economy.

Ask your Crane Representative how to cut valve maintenance and replacement costs in your plant.



**IDEAS FOR YOU.** Ask your Crane Man for a copy of "Valve Performance Facts"—a 36-page circular of on-the-job economies made with Crane valves. Or write to address below.

## CRANE VALVES & FITTINGS

PIPE • PLUMBING • KITCHENS • HEATING • AIR CONDITIONING

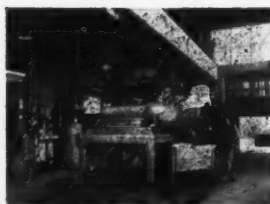
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**SOLIDS-LIQUIDS  
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**The Bird Continuous Solid Bowl Centrifugal Filter**  
for thorough dewatering of slurries in large or small volume, thick or thin, hot or cold; solids coarse or fine.



**The Bird Continuous Screen Type Centrifugal Filter**  
for uniformly efficient separation and washing of crystalline or granular solids.



**The Bird-Prayon Horizontal Tilting Pan Vacuum Filter**  
for removal of solids difficult or impossible to handle on drum type filters, exceedingly thorough wash with minimum wash liquor and without dilution of mother liquor. Filter areas from 100 to 500 sq. ft.



**The Bird-Young Continuous Rotary Single Cell Vacuum Filter**  
for maximum capacity per foot of filter area, complete dewatering and washing and truly effective discharge of filter cakes even when exceedingly thin.



**The Bird Horizontal Tank Vertical Leaf Pressure Filter**  
for large volume, low cost liquid clarifications. Filter areas from 10 to 1500 sq. ft.



**The Bird Suspended Batch Centrifugal**  
for heavy duty, high capacity separations of clarifications; 26", 40" or 48" perforate or imperforate baskets; fume-tight, if needed; available in standard models or custom built for special applications.



**The Bird-Humboldt Oscillating Screen Centrifugal Dryer**  
for dewatering of coarse or granular solids; a new and advanced design that assures extra long screen life and extra low power cost.

### THE BIRD RESEARCH AND DEVELOPMENT CENTER

is a completely equipped test plant devoted to solids-liquids separation test work. It is yours to use. Bulletins describing any or all of the above items will be mailed on request.



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**'Any engineer doing recognized engineering work is practicing a profession', says Garvin Dyer. 'In order to get the proper legal recognition necessary to boost his professional status' . . .**

## ENGINEERS SHOULD BE LICENSED

**GARVIN H. DYER**

President  
National Society of Professional Engineers

I believe that any individual who performs engineering work should be registered, and will be required, by law, to be registered within the not-too-distant future.

Many engineers today may not agree with these statements. There has always been, unfortunately, an element of opposition to the whole concept of registration. When registration was first proposed as an item of law, there was even opposition to the idea that any engineer should be registered. Over the years we have seen the disappearance of this type of opposition as engineers realized how vital the state registration laws could be to the entire structure of professionalism.

Today, most of what could be called "opposition" takes the form not of opposition to the existence of state laws, but rather of a general reluctance on the part of individual engineers to take the trouble to go through the steps required for registra-

tion. This reluctance is generated by the feeling that there isn't enough to be gained in practical or prestige terms from engineering registration.

The more forward-looking segment of the engineering profession has understood for years that there is very definitely much to be gained by registration. This group has worked steadily for the passage of state registration laws, and these laws are now on the books of every one of the 48 states, and the territories as well. Such unanimous recognition by the lawmaking bodies of the states would seem to give the impression that our lawmakers are more cognizant of engineering as a profession than are many of our engineers.

Engineering registration laws were adopted over a period of 50 years. Consequently, there is considerable variation in the wording of the laws from state to state. To help clarify this situation, a model engineering reg-

*To next page*



Professional engineer William O'Brien of the Du Pont Company in Wilmington, Delaware, proudly hangs his newly won registration certificate on his office wall. Du Pont has been a leader in encouraging registration of its engineers

**GARVIN H. DYER**, NSPE president for 1957-58, has been actively engaged in water works operation and management for over 33 years. He was recently elected to the board of directors of the Missouri Water Company, and has been, since 1947, manager and chief engineer of the Independence, Missouri, division of the firm. Prior to that, he was engineer, assistant superintendent, and secretary of the Springfield City Water Company.

He served two years as NSPE vice president, and is a former member of the Board of Directors. Mr. Dyer is past chairman of the Missouri Water and Sewage Conference, and received its Award of Merit in 1954. He is an honor member of Chi Epsilon and is active in numerous professional and civic organizations.

## Engineers Should Be Licensed From preceding page

istration law was developed and this has now been approved by 13 engineering societies, including the National Society of Professional Engineers.

The engineering registration laws now on the books specify which engineers in the state must be registered in order to practice. They cannot be interpreted to mean that every engineer who practices without being registered is breaking the law. While enforcement of registration laws has not always been as vigorous as we would like to have seen it, there have been a number of court cases in which convictions were brought against non-registered engineers.

### Why Should Engineers Register?

To answer this question, it is necessary to delve into the basic meaning of the term "profession". In defining this term, we usually mention such things as a type of activity requiring extensive educational background, a high level of intellectual effort, a dedication to the highest standards of ethics and public service, and a recognition under the law as a profession.

It is this latter point that gives a profession its legal status. Engineering registration is recognition of engineering as a profession under the law. Engineers who do not register are foregoing one very important factor in the definition of a profession. These engineers are excluding themselves from recognition as professionals under the law.

It should be emphasized here that a profession is not satisfactorily defined by any one of the factors involved in its definition. A profession is more than a dedication to high standards of ethics and public service. It is more than an activity characterized by intellectual effort, and it is more than an activity which is recog-

nized by a state law.

Registration by itself does not automatically confer professional status. But registration is recognition under the law, and such legal recognition is a part of the definition of a profession.

### Protects the Public

Registration also affords a considerable measure of protection to the general public. When an engineer is registered under the laws of his state, he is placed on file as a professional, fully qualified to practice in his particular field.

The public has no such assurance regarding the non-registered engineer. The mere possession of a degree in engineering is not indicative of an individual's competence to practice. Analogies with the medical and legal professions are obvious. A physician or attorney cannot practice unless he is licensed by a state to do so.

The engineer does not ordinarily deal directly with the public, nor does he render the same kind of decisions as a physician or attorney. However, the principle is the same — the engineer is a practicing professional who is rendering services that

### About the National Society of Professional Engineers



Founded in 1934, The National Society of Professional Engineers, is an organization numbering more than 43,000 members. It devotes its entire effort to the professional, ethical, and social aspects of engineering. Its membership consists of registered, professional engineers engaged in all branches of the profession.

The individual members act through more than 350 local chapters and 45 state societies.

The Society is actively engaged in programs for the advancement of the engineering profession in the fields of employment practices, engineering registration, ethical practices, legislation, salaries and fees, military affairs, public relations, and education of young engineers.

Its headquarters is at 2029 K Street, N.W., Washington 6, D.C.

his employer or client cannot test or verify without engaging other engineers. The employer or client has a right to enjoy the full protection of the law against unscrupulous and unqualified individuals.

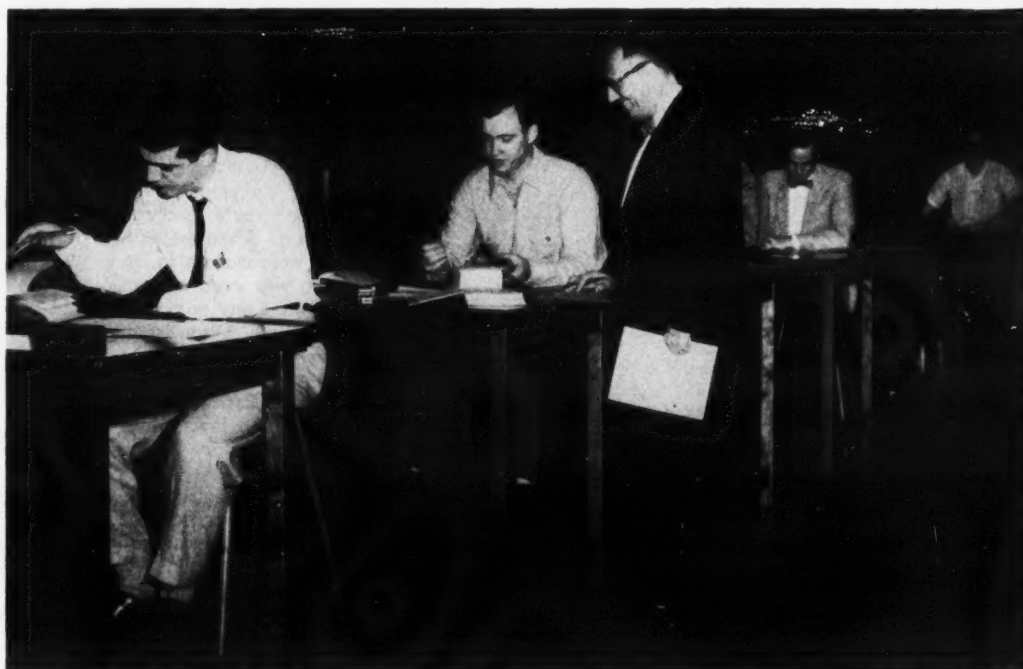
As in so many fields of human endeavor, a profession is judged by the qualifications of all those who practice in the name of the activity. A profession should be empowered to disown those who hold themselves out as belonging to it without proper qualifications or character, and to bar the unfit and the unprincipled.

A state board of registration can do these things. Of course, any examining board is made up of human beings, and there are no absolutely fool-proof systems for filtering out from the profession all the scoundrels and would-be-scoundrels. But the registration requirements are a step in the right direction.

### Effect Registration Has on Engineers and Their Jobs

When an engineer qualifies for registration he does not, of course, suddenly become qualified for a jump up the professional ladder. The bene-

*To page 300*



Mr. Clarence Evans, chairman of the Delaware State Board of Registration, discusses engineer-in-training examinations with young Du Pont engineers. This is the first step toward final registration as a professional engineer

Twice in recent years polyethylene has seized the limelight; twice, a host of chemical makers have joined the rush to get into production. So far, markets for the material have grown far beyond the most enthusiastic early hopes of its manufacturers. But what of the new surge of interest in polyethylene? Here is a look into the future markets of the plastic, and the probable outcome of . . .

# The Second Polyethylene Rush

BILL SCHREMP

Chemical Business Editor

A business historian would probably date the beginning of the US polyethylene industry at September 7, 1941. On that date, Sir Harry McGowan, Board Chairman of Britain's Imperial Chemical Industries, wrote to Walter S. Carpenter, then President of Du Pont:

"My Dear Walter," the letter began, and in a tone characteristic of the War years continued, "I am writing you confidentially on a matter . . . of utmost importance in both our countries . . ."

Ethylene had first been polymerized in ICI's labs in 1933. At first it made precious little impact on the World but ICI went ahead to put up a pilot plant to produce small quantities of the material. Nothing much came of the new polymer until the Battle of Britain. Then technicians working on radar equipment for defense against the German Air Force found that polyethylene provided excellent insulation for high-frequency equipment and was rugged enough to stand up under combat conditions. ICI quickly built a plant to provide the needed quantities of the material.

The purpose of Sir Harry's letter was to advise Carpenter that the US Navy had shown some interest in the material for its own radar equipment, and that

it might be wise for Du Pont to do what it could to aid the progress of the material over here. Du Pont indeed could, and did, do something.

## Du Pont Was First

In March 1942 Du Pont signed a contract with the Navy calling for a two-million pound unit. The war effort needed such quantities of the plastic, however, that Union Carbide, who had developed its own process, was also given a contract. Its Charleston, W. Va., plant was on stream by early 1943.

At the end of the war there were still only two producers in the polyethylene business — Du Pont and Carbide. Then began a chain of litigation which ended with a court decision that ICI (it fell under US jurisdiction through its New York subsidiary) must license the process to all "bona fide" applicants.

The decision was handed down July 30, 1952, the ICI representatives were in this country by September, and by Christmas over twenty US companies were exploring the possibilities of producing polyethylene. And by Spring of 1953 five additional chemical makers — Dow, Monsanto, Eastman, Spencer, and National Distillers — were in the polyethylene business.

Thus began the First Polyethylene Rush.

And now, only four years later, the Second Great Rush is underway.

The Second Great Rush is probably not so dramatic as the first. But what it lacks in drama it makes up in magnitude. Instead of one process, there are three. (Actually there are five processes. Beside the three — Ziegler, Phillips, and Standard of Indiana — which figure most heavily today, R. S. Aries, is reported to have a workable low-pressure system and Allied has a process of its own which isn't offered for sale.) Instead of five companies going into a new field there are 13 going into a field already pretty well populated by low-density producers. And instead of reasonably free markets waiting to be developed, the new, high-density producers face fierce competition among themselves, from producers of conventional polyethylene, as well as other plastic materials, and — this could be the most formidable competition of all — polypropylene.

Before exploring the markets for polyethylene — new and old — it might be well to define the materials. Although generally thought of as the same product made by two different methods, the materials are distinctly dif-

ferent. The high-density material — linear polyethylene, rigid polyethylene, low-pressure polyethylene; there are a number of names for the material, all more or less acceptable — is a generally tougher material. It's more rigid, more resistant to abrasion, has higher tensile strength, less vapor transmission than the conventional material. It's also more expensive than the less-dense polyethylene.

Where conventional polyethylene is made under extreme pressure — up to 2500 atmospheres and sometimes above — the new plastic is produced at near atmospheric pressure in the presence of a catalyst. The appearance is essentially the same, although the low-pressure material tends to be more glossy in injection molding and the uncolored plastic is rather more opaque.

## 'Up To Our Elbows in Polyethylene'

It's almost a truism in the chemical industry that what may be looked upon as a glut today may well develop into a serious shortage tomorrow. If this holds true in the case of the polyethylene makers — and this is the readily admitted philosophy of those in the field today — then their rosy expectations will

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**HENRY H. REICHOLD**, president of Reichhold Chemicals, Inc., was born in a Berlin suburb, and received a technical education in German Universities. He came to the US when he was 22 to study automobile surface finishing techniques, taking a job with the Ford Motor Company in the paint department.

Within a short time he began experimenting with synthetic resins in order to perfect a faster drying, more durable auto finish. He conducted these trials in the garage of a friend of his, Charles J. O'Connor, today Chairman of the Board and a Director of RCI. The finish he developed dried satisfactorily in a few hours as against the two weeks time required for the finishes then in use.

In 1927, Mr. Reichhold gave up his job with Ford—soon to be an RCI customer—and bought a paint factory in Ferndale, just outside Detroit, where he founded his first plant.

Through the years of course, RCI has grown to a company manufacturing synthetic resins, basic chemicals, inorganic color pigments and a host of other raw materials for US industry. The company today owns thirteen plants in the US and has ownership interest in, or affiliations with, 23 others manufacturing RCI products around the world.

## A chemical company should not enter the consumer field

Although the consumer market offers exciting benefits — it is wrong to enter into competition with your customers.

Also, a chemical company is usually not equipped or manned to operate in the highly competitive consumer field.

### HENRY H. REICHOLD

President and General Manager  
Reichhold Chemicals, Inc.

An important corporate decision that I am certain almost every policy-making executive of a chemical company has thought about — or perhaps had to act upon — within the past few years is whether or not to yield to the temptation of broadening horizons by entering the consumer market. Placing a product before the consumer is more than a temptation—it is part of the recent tendency to expand competitively. The decision to proceed with a consumer product would affect the entire structure and all phases of operation of a chemical company which has never before dealt directly with the housewife, the dealer, or the distributor of consumer goods.

If one is guided by a firm policy on this subject, the decision will be easier to make. I feel strongly that this policy should be against a chemical company entering the consumer field. A chemical company should, indeed, remain in its own field and concentrate its efforts on making better products and selling more of the products it does produce.

This policy has guided RCI since its inception in 1927. As a result, when a sound financial opportunity to enter the consumer field with a product utiliz-

ing RCI materials has arisen — as has happened in recent years — the decision against such an action has always been relatively easy to make — no matter how tempting and beneficial the prospect.

There are two convictions upon which this policy is based. One, is that it is entirely wrong to enter into competition with your customers. Two, regardless of how successfully and how intelligently the operation of a chemical company may be, in most cases the company is simply neither equipped nor manned to operate in the consumer field.

### Customer's Viewpoint

Looking at the first point from the customer's point of view, if I were in the paint manufacturing business, I would not enter the resin business. Conversely, being in the resin business, I will not enter the paint manufacturing business. Even though a chemical company may decide to produce a consumer item, the backbone of its existence would still be the production and sales of its raw materials to its customers. How can such a company hope to sell its customers when it competes with them, and



### A chemical manufacturer *should* . . .

. . . concentrate on making better products and selling more of the products he does produce

when there is the possibility that eventually, if successful, the chemical company will produce products more and more like the ones the customer makes?

#### Chemical Company Should Do Research for Customers

A chemical company should do considerable research for its customers on their products, helping them to develop improvements or wholly new items as well as finding ways for them to better their own manufacturing processes. To improve the competitive position of their customers should be one of the important aims of all makers of raw materials. An increased demand for customers' products increases the demand for raw material, a far healthier move than going into competition with the customer.

Setting up a consumer product structure that could introduce merchandise, and maintain the sale of a product is an enormous venture that would require huge outlays of capital. Experienced personnel in all the many departments of manufacture, merchandising, and promotion would be required. Despite the work of these new people, however, there would be an unavoidable demand

on the time of the regular executive staff and department heads. In a move as radical as this, the knowledge, enthusiasm, and co-operation of all key men is needed to implement the program. They could not help but neglect, at least to some extent, their established duties and routine to give the new undertaking the attention required, and for this reason regular business would suffer.

Imagine the dealer organization of retail operations such as Revlon, Procter and Gamble, or other companies attuned successfully to the consumer field and all its complexities. It would take many years and an enormous investment before any chemical producer could hope to match the profits earned by the great soap, breakfast cereal, or tobacco makers — all expert in distributing and selling retail items.

#### Huge Amounts of Money Needed For Consumer Market

The introduction, then, of a new consumer product, the effort to make the dealer and the public aware of the new trademark, and the maintenance of this interest in the form of advertising,

### A chemical manufacturer *should not* . . .

. . . enter the consumer market and compete with his customers

merchandising, publicity — all absolutely necessary functions in the attempt to successfully launch a new product — require staggering amounts of money in addition to the outlay for the organization of the consumer company. This financial outlay, if withdrawn from working capital, means deferment or curtailment of sound expansion plans already made.

If, instead of using its own funds, the firm goes out in today's tight money market to borrow, the present high rates of interest must be included in the selling price. I would prefer to see a chemical company put this money — or rather some portion of it — into the sales of the products it manufactures, into the development of new, improved products within the scope of the company's work, and into research and development — in other words, into the company's regular chemical industry activities.

Some may point out that the introduction of a new consumer product, assuming that it is successfully presented, possibly would serve to increase interest in the purchase of the company's stock. Certainly individuals reading and hearing about a new

product may be tempted to invest in the company manufacturing the item. At RCI we are particularly conscious of this because, since making the move to public ownership in 1956, we have naturally been eager to see RCI stock held as widely as possible. However, to get new stockholders by introducing a consumer product strikes me as a very expensive operating procedure. It the same amount of money . . . or even a substantial portion of it . . . were put into advertising, public relations, and stockholder relations, I believe the result would be far superior corporate benefits — not to mention prestige.

#### Was Tempted By Consumer Field

As I said in the opening of this article, the idea of making end products is often suggested. I must admit that I was quite tempted some ten years ago. At the time I was closely identified with the Detroit Symphony Orchestra and had many valuable contacts in the world of serious music. Music and chemistry have always meant a great deal to me, and I thought, then, that I could

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# Chemicals and Latin America

**J. PETER GRACE**

President

W. R. Grace & Company

**W**hen W. R. Grace & Co. made its decision to enter the US chemical industry following World War II, we were very conscious of the fact that our already existing framework of business in Latin America would eventually afford an excellent opportunity to transplant our increased chemical know-how into the Republics where we had been so long active.

Once we made the decision, we launched into the US chemical industry on two fronts. One — we undertook large-scale “grass roots” chemical enterprises and started by forming the Grace Chemical Company in 1952, which erected a \$20-million ultra-modern ammonia-urea plant in Memphis, Tennessee, in 1954.

Our second step was to merge with existing chemical companies which were equipped with a full complement of research talent, plants, products and marketing experience. In addition to acquiring some fine chemical management, we established working arrangements with leaders of chemical research both here and in Europe which have proved extremely valuable.

Today our US chemical operations comprise 55% of our net fixed assets. Our chemical group includes seven divisions with 39 plants both here and abroad. We manufacture chemical products ranging from plastic food packaging to sealing compounds; from

urea and ammonia to mixed fertilizers and petroleum cracking catalysts.

This entire US chemical expansion program is supported by aggressive and imaginative research, under a budget that amounts to over \$8 million in 1957.

As a result of the position we have gained in the United States, it is our belief that we are ready for significant chemical growth in Latin America where we have achieved broad industrial managerial, marketing, and distributing experience.

## South American Projects

Accordingly, we have many chemical projects on the drawing board and have begun work on others. One is a joint venture in Brazil with Farbwerke Hoechst AG of Germany. The project involves a DDT, solvents and detergents plant which is scheduled to go on stream by early 1958. Our Dewey & Almy Overseas Division also operates a modern plant near Sao Paulo, manufacturing can-sealing compounds for the food industry, and has another in Buenos Aires.

Two other projects, which are related to the chemical processing industry and engineered by our Latin American Paper & Chemical Division, include a major investment in paper-making from bagasse and a permanent-magnet-alloys plant in

Brazil. The magnet plant, in partnership with Eriez Manufacturing Company, is new, while for almost twenty years we have been making paper from bagasse (sugar cane waste) at our Paramonga sugar estate in Peru. We recently decided to exploit paper manufacture in other countries, concentrating in Cuba and Puerto Rico.

Construction is now in progress on a new bagasse mill in Puerto Rico. Additional projects also under study call for the construction of new mills utilizing bagasse or other fibers in a number of other Latin American countries where raw materials are readily available and markets appear promising. Because of a new pulping method, which transforms bagasse into pulp within minutes after it leaves the sugar mill, we have high hopes for the success of this ambitious project.

At Paramonga, where Grace pioneered in the first commercially successful paper-from-bagasse mill in the world, we expanded the capacity of our plant in 1955 by 50%, and the next stage of expansion is now underway to increase capacity again by 50% — to 45,000 tons per year. Other steps in the program have included the purchase of paper converting plants in Puerto Rico and Cuba in 1956.

At the same Paramonga sugar estate in Peru we also refine 47,000 tons of sugar each year

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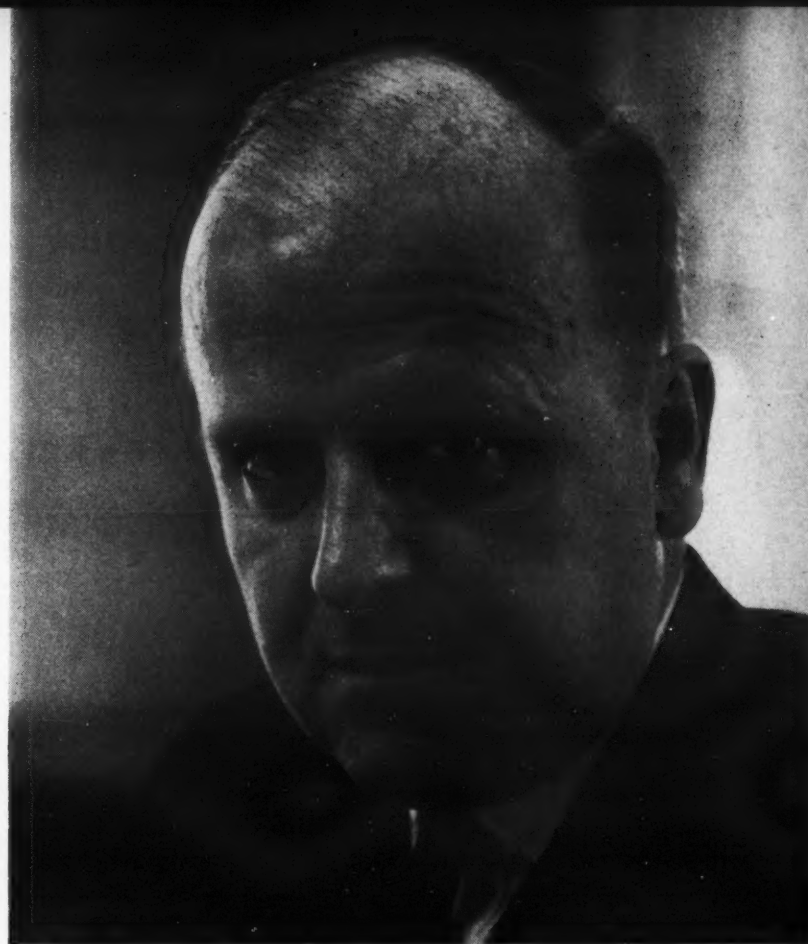
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**J. PETER GRACE**, President of W. R. Grace & Co. since 1945, represents the third generation of his family to hold the presidency of the firm founded over a century ago by his grandfather, William Russell Grace.

Grace joined the company upon his graduation from Yale in 1936. His activities included accounting, insurance and industrial departments and other basic divisions of the Grace operation. He was elected Secretary of W. R. Grace in 1942 and a year later was named a Director. In May 1945 he was elected a Vice-President and in September of that year he was named President.



# in America

GRACE

Company

and manufacture caustic soda, alcohol, chlorine and hydrochloric acid. Another project now in final stages of negotiation is a new alkali plant which will go far toward supplying Peruvian industry's needs for caustic soda and soda ash, and which will supply chlorine for future development of the country's chemical industry.

We are continually studying other new areas in Latin America where we can fully utilize the knowledge and experience which we have gained as a chemical company in the US. For example, we are considering a petrochemical unit in Brazil and an ammonia-urea plant in the West Indies. These projects are still in the drawing board stage and require careful planning and negotiating. But they reflect our continuing faith in the Latin American economy and especially the growing chemical industry.

## Latin American Chemicals

But what about this growing chemical industry in Latin America? How much has it expanded and what are the prospects for continued growth? If we briefly examine a few recent production figures, we can see that while the industry is still relatively small compared with that of the US, its potential is just beginning to materialize.

It is estimated that the rise in Latin America's consumption of

chemicals and allied products has tripled its prewar level, while general industrial output, on the other hand, has only doubled over the same period. This growing consumption has generated a simultaneous rise in domestic chemical output and imports.

Fertilizers have to date represented the most important phase of the Latin American chemical industry. Agricultural products make up a quarter of the area's total production and half of its total exports. Increased use of fertilizers is, of course, essential to boost agricultural production.

In Latin America, petrochemical development is the key to increased fertilizer output. In the last few years a considerable number of new nitrogenous fertilizer plants, financed by local capital has sprung up in many Latin American countries. Brazilian facilities now have an estimated annual capacity of 130,000 tons. A new Mexican plant is producing fertilizer at a rate of 180,000 tons per year. In Peru, work was started on a new project in 1956 which will produce ammonium nitrate and ammonium sulfate. Work on a Colombian plant to produce an annual 100,000 tons of ammonium nitrate and urea is underway. And a similar plant with even greater capacity is also nearing completion in Venezuela.

Local capital again is building heavy industrial chemical plants in Argentina, Brazil, Chile, and

Mexico. However, growth of heavy chemicals is impeded by the limited size of the market, which restricts production to small-scale facilities with high unit costs. It is estimated that the average cost of locally produced heavy chemicals is double that of the same items imported from the US.

Nevertheless, sulfuric acid output rose from 301,000 tons in 1950 to over 350,000 tons in 1956. Production now is almost sufficient to meet domestic needs, and imports run less than 1% of total use. Caustic soda output is only 30% of consumption even though production rose from 70,000 tons in 1950 to 104,000 tons in 1956. Soda ash production increased from 5000 tons in 1950 to 16,000 tons in 1956, but consumption still exceeds output by a wide margin. However, Brazil is building a 100,000-ton plant at Cabo Frio which, when completed in 1958, will increase Latin American production of soda ash six times.

Production of drugs, dyes, syn-

thetic fibers, cellulose, and consumer chemicals is largely meeting domestic needs in Argentina, Brazil, Chile, and Mexico. Other nations are also beginning to manufacture these items.

Production of molded plastics has risen considerably in recent years. In Argentina, output of phenol-formaldehyde and urea-formaldehyde amounted to 7000 tons in 1956. Brazil produced 24,000 tons last year of polystyrene, polyvinyl chloride, urea-formaldehyde, cellulose-acetate, polyethylene, melamine, phenol-formaldehyde, and acrylic resins.

Pharmaceutical output has also developed considerably, although much of this production depends on imported raw materials and intermediate products. Brazil has shown the most spectacular rise in this field, and at the end of 1956 there were 525 pharmaceutical manufacturing enterprises in that country. In Colombia, the pharmaceutical industry met over 50% of the country's requirements and, in 1956, in-

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Credit for development and application of the Project Number goes to President Vova Blinoff and Vice President Carl Pacifico of American Alcolac Corporation.



**DR. VOVA BLINOFF** is a pioneer in the field of synthetic detergents. He obtained his PhD in 1926 from the University of Dorport, and in 1933 helped found Societe Sinnova, in France. He came to the United States in 1953 to become president of Alcolac. Dr. Blinoff enjoys working with mathematics and firmly believes many business problems can be solved with this tool.



**CARL PACIFICO** earned his degree in Chemical Engineering from Drexel in 1943. Since then he has done more and more work in less technical business fields and is now responsible for marketing activities at Alcolac. He finds a study of the human mind most useful in setting up the procedures that guide business growth. Under the guidance of Blinoff and Pacifico, Alcolac is currently applying the mathematical treatment to other phases of business operations. These range from engineering calculations for replacing equipment, to determining how best to handle seasonal variations in demand for products.

Frequently in business, improper use of available funds is a stumbling block on the road to success. Poor money management causes a large percentage of business failures. An important part of using money wisely depends on . . .

## CHOOSING THE RIGHT PROJECT

Facing everyone concerned with guiding a company along the thorny road of present-day business, is the question, "Where should our money go?" Each research project is an investment just as surely as is a purchase of plant equipment. Since an unsuccessful project does not even leave equipment to be used in future processes, it is especially important that project investments be made wisely. We can go to the bank to obtain money, a good psychiatrist will help shattered nerves. When it comes to picking the product on which future business will depend, where can a harried executive go for factual information on which to base his decision? Lab reports, salesmen's field evaluations, and available production facilities and know-how hold one key to the answer, but fitting this key in the right doorway can be a confounding quandary. Let's look at a possible answer: the Project Number.\*

This number is not a formula compiled from empirical experiments or from experience, as in the case of heat-transfer coefficients in a heat exchanger. It is the analysis into its factors of the standard calculation of return on investment of any project. "How much money will we make and how much money will we have to invest to get it? What are the chances that we will succeed or fail?"

The higher the Project Number the more profitable it is likely to be. The formula does not supply any new information. It aids, sometimes even forces, management to crystallize its information on each project so that any decision is made on an objective instead of a subjective basis. Pet project ideas can be subjected to the cold light of a mathematical formula to see if they measure up to a profit-potential benchmark. Gathering the data for a Project Number determination serves a most useful purpose by spotlighting where preliminary information is inadequate. The Sales Department may need more accurate data on projected sales volume or the technical group more detailed cost figures.

### Determining the Figures

**Risk:** Values assigned to risks are based on experience. They will vary considerably from company to company. In earlier stages of considering a project there is, naturally, an element of uncertainty of success. For convenience this uncertainty is expressed on a scale from 0 for "no chance of success" to 1.0 for "certainty". Alcolac divides this into commercial and technical success — the former estimated by sales, the latter by research and production. These are multiplied together as the total risk depends on both factors. If a

$$\frac{\text{*Risk x (Total Net Profit Obtained)}}{\text{Total Net Cost}} = \text{Project Number}$$

# PROJECT

company desires to minimize risk in projects it undertakes, the square of the decimal assigned to risk can be used. In this way less risky projects will have a higher Project Number.

**Total Net Profit Obtained:** The total amount of money to be made is broken down into components for clarity:

Total return = Annual Volume x Net Profit (price-cost) x Life. Annual volume is, of course, estimated by the sales or market research department. Life expectancy also must be estimated. At American Alcolac, maximum life assigned to any project is three years, as product life is usually short in this field. If a company prefers projects which provide a faster return over projects which give the same amount of money, but over more years, the square root of life may be used. If desired, projects with greater profits-per-pound can be favored by raising this term to some power, such as 1.5.

**Total Costs:** Cost of a project can also be broken down into components and must include all investments not included in product cost. For a typical project: Total Cost = Research + Engineering + Market Development + Working Capital + Plant Costs + Miscellaneous Costs, such as patent royalties.

## Putting the Formula to Work

Suppose we look into two projects (next column), which appear sufficiently similar on the surface to be confusing, to see how

### COMMERCIAL INGREDIENT

Chances of commercial success	0.75
Chances of technical success	0.95
Potential volume, lb/yr	1,000,000
Selling price, \$/lb	0.20
Manufacturing cost/lb	0.13
Research cost, \$	5000
Market development cost, \$	5000
Plant investment, \$	0
Life (based on maximum for a short-life field), years	3

Project Number thus is:

$$\frac{0.75 \times 0.95 \times 1,000,000 \times (0.20 - 0.13) \times 3}{10,000} = 8.6$$

### SPECIALTY INGREDIENT

Chances of commercial success	0.95
Chances of technical success	0.7
Potential volume, lb/yr	250,000
Selling price, \$/lb	0.35
Manufacturing cost, \$/lb	0.27
Research cost, \$	5000
Market development cost	small
Plant investment, \$	2000
Life (based on maximum for a short-life field), years	3

Project Number here is:

$$\frac{0.95 \times 0.7 \times 250,000 \times (0.35 - 0.27) \times 3}{7000} = 3.3$$

Project Numbers are put to work. Both are moderate-size projects, and since similar products are already being produced at Alcolac, no substantial plant investment was required.

One of these projects was a request from a company to make a product for it. In this case chances of commercial success were quite high while the percentage profit was modest.

The second was a product for

general use, requiring some market development activity and a lower chance of reaching the sales objective. Both were shampoo ingredients.

Both projects are acceptable under certain conditions since they both return more than the amount of money required for investment. On the basis of relative Project Numbers, however, the more general product (with a P.N. of 8.6) was selected.

No indication is given by the Project Number of the order of handling projects. It is easy to assume that the higher the Project Number the higher the priority. However, if money for a required plant is not available, a project would be deferred regardless of its number. Also, Project Numbers do not distinguish large projects from small ones. Naturally Project Numbers can only be significant to the extent of the accuracy of the data used. They are useful for screening but will not decide directly if the project fits into company operations or desired direction of growth.

### Advantages

Analysis of projects into Project Numbers serves to: 1) emphasize the need to obtain reasonably accurate data on all phases of the project, 2) compare projects for a determination of what can be expected in the way of return . . . where our money can best be used, 3) provide an objective method of evaluating suggestions for new products. This reduces the emotional aspect in rejecting or accepting project ideas. Critics may argue with the practicability of this formula, but with it American Alcolac has built much of its position in the chemical industry today. The company is currently one of the largest producers of alcohol sulfates in the United States. In six years — it turned out its first batch of chemicals in December, 1950 — sales have grown to over \$2 million a year. ■



The chemical processing industries were indispensable in the development of the wartime nuclear program and have worked hand-in-hand with the Atomic Energy Commission to bring peacetime applications to the positions they occupy today. Here, W. Kenneth Davis, head of the AEC's Reactor Development Division, tells how the chemical industry can and must continue its contributions in order for the world to know the beneficial as well as the destructive effects of the atom.

# Chemistry and the Atom

**W. KENNETH DAVIS**, Director  
Division of Reactor Development  
Atomic Energy Commission



The chemical industry's past contributions to the development and application of nuclear energy have been invaluable. To begin with, chemistry has provided indispensable tools and methods for research and production. Chemistry has played a leading role in the processing and purification of uranium ores; in the separation and use of isotopes; in the production of nuclear fuels; and in the development of nuclear reactors.

The past contribution of chemistry to the development and application of atomic energy is an interesting story. However, our purpose here is to point up some of the problem areas where chemistry can make further significant contributions.

Many of these problems demand an understanding of now unknown principles and the development and application of hitherto unimagined methods and techniques. In short, we have, to a large extent, used up our backlog of basic knowledge. We must now develop a new body of fundamental knowledge and weave this into new theoretical concepts which can obviate the need to rely on purely empirical ap-

proaches to the solution of problems.

## Processing Nuclear Materials

Some of the most pressing problems hindering the development of economic nuclear power lie in the field of chemical processing of irradiated fuel elements. When fission takes place in a reactor, a mixture containing radioactive isotopes of many elements is left behind. These "nuclear ashes" must be removed from the reactor and the unused nuclear fuel recovered.

A variety of circumstances complicate the job at present. One is the need for remote handling of materials to protect workers from toxic substances and lethal radiations. Further complications arise from the fact that reactor designs now being used or under consideration for military and civilian purposes employ fuels of many different chemical compositions and geometrical configurations.

## Technical Problems

In the case of solid fuel elements, which are fabricated in all kinds of sizes and shapes, the reprocessing problem is further

complicated by the fact that a variety of insoluble materials are used as protective cladding. Still other materials are used to bond the cladding material to the fuel material and to enhance heat-transfer characteristics. In addition, all manner of mechanical contraptions are used to hold the fuel elements together or apart. Processing methods must be adjusted for each of these variations.

In the processing of fuel elements, any structural or cladding materials must be removed mechanically or chemically. A difficult contradiction may appear here, in that the designers have frequently aimed at fuel elements that are highly resistant to chemical attack or corrosion. The greater their success, the more difficult may be the task for chemical processing.

## Economic Problems

While still other technological problems in the area of processing irradiated fuel elements could be listed, enough has been said to indicate the scope and complexity of the problem. Let us now take a brief look at some of the economic difficulties from the chemical processor's point of

view.

For one thing, the potential industrial processor wants to know how much fixed and working capital is necessary to build and operate a suitable plant, and the prospects for a fair return on investments. But these are very difficult questions to answer. Capital cost estimates run from \$5-million to \$35-million, depending on the kind and capacity of the plant and the variety of fuels it can handle.

The industrial firm considering whether to enter the chemical processing business would also like to have information as to the kind and the volume of material which may require processing. But at the moment, these are exactly the types of questions most difficult to answer. As indicated previously, a wide variety of solid and fluid fuels are contemplated for heterogeneous and homogeneous reactor designs. Though it is difficult to predict which fuel elements may be used a few years hence, it is safe to assume that there will be a wide variety, each used in relatively small quantities. A more favorable economic and technical situation for chemical processors would be just the opposite —

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**WILLIAM R. BRADLEY'S** present roles, as chairman of the Air Pollution Control Commission of the State of New Jersey, and as member of the Air Pollution Control Association, are some of the many activities in which he has participated in the interest of pollution abatement.

Previously he was president and director of the American Industrial Hygiene Association, the Michigan Industrial Hygiene Society, and the Metropolitan New York Industrial Hygiene Association.

As chief industrial hygienist for American Cyanamid Company, he has staff responsibility for a broad industrial hygiene program, and supervises modern pollution control measures in highly diversified chemical operations involving about 40 industrial plants.

A lecturer and writer on subjects of industrial hygiene and toxicology, Mr. Bradley first presented the philosophy program described in this article at the MCA's 1957 Pollution Abatement Conference.

**W**E have often witnessed the enactment of Federal State, and Local legislation against pollution. We have seen the expenditure of ever-increasing sums of money in research on methods of evaluation and in techniques for abatement. Also, we have seen, with increasing frequency, episodes of litigation because of actual or potential pollution.

It is apparent, therefore, that a new approach by industry to the problem of pollution control must be inaugurated. It is necessary that industry recognize pollution when it exists and act in a positive manner toward abatement. The day is past when pollution can be ignored until someone complains about it. This old philosophy is now outmoded and should be abandoned. In case after case where industry has failed to recognize pollution problems the matter has been taken out of its hands and into the courts. Sympathy, for those of our industrial neighbors who

have the cost of control added to the burden of litigation, does not seem commendable unless that neighbor has a complete and active program of pollution prevention in operation. If not, our sympathy reflects approval of the same negative viewpoint.

#### A New Ten-point Philosophy

A new, modern, and positive philosophy has been successful in dealing with pollution problems. This approach to a common problem is the result of a lesson that has been taught over and over again for the last fifty years. However, it has not been learned except by a few members of the chemical industry. The ten steps in this program, if adopted, will return dividends of good will for our industry and mark us as a leader in pollution abatement. Such a position will be worthwhile. The ten steps are as follows:

1. Determine by sampling and

study if pollution problem exists. In this connection, work closely and confidently with official Pollution Control Agencies.

2. If you have a problem, recognize it, for pollution cannot easily be concealed.
3. Begin control studies through stack sampling and general air and/or water sampling.
4. Begin a public relations program advising the community of such work.
5. Using the data obtained, begin research on methods for control through pilot studies.
6. Apply the results of research to engineering development of control facilities.
7. Install proven and tested control equipment.
8. Keep the plant neighbors informed of progress.
9. Invite the public to inspect the accomplishment and to celebrate success.
10. Inform companion indus-

tries of pollution control techniques that may be useful to them.

#### Public's Responsibility, Too

Many segments of the general public, that is to say, many private citizens and municipal governments, fail to recognize that they cause air pollution in permitting open burning on dumps, the operation of improper incineration and smoke and fly ash from improper combustion of fuel. The solutions to their problems are known and have been proved by testing and by experience, and slowly they are being adopted. Solutions to most of industry's pollution problems are likewise now known and simply need only testing and engineering for the specific installation before their adoption. The delay in the recognition of a problem and the adoption of a solution has been attributed to many things, un-

To next page

## Take a positive approach to pollution control

**... is the advice of William Bradley, chief of American Cyanamid's Industrial Hygiene Section. To help companies overcome their pollution abatement problems, that might otherwise result in community hostility and possible litigation, Mr. Bradley outlines a new ten-point philosophy that has proved successful within his company**

#### WILLIAM R. BRADLEY

Chief, Industrial Hygiene Section  
Central Medical Department  
American Cyanamid Company

favorable economics being the most common plea. This appears to be an excuse and not a sound reason, because delay has resulted for the most part in extra costs.

As part of this new philosophy we must recognize that it is possible to prevent most pollution before it occurs. Control equipment can, and is being designed and tested and is being added to the engineering blueprints for new plant construction and for changes in existing processes. Chemical companies operating under such a procedure are increasing in number. However, in many companies it is difficult to obtain financing for preventive programs. Seldom are they dramatic, their heroes remain unsung and what otherwise might have happened never occurs.

## Company-wide Interest Necessary

Obtaining company-wide interest in pollution prevention is primarily a matter of conference, discussion and explanation. It is the result of establishing company-wide participation in a study of an actual pollution problem. Call it education, if you will. The first step is to select an existing serious problem and work up a complete case against yourself. Then with the facts at hand you are ready for a series of conferences aimed at leading ultimately to a decision on procedure.

With the facts at hand, the seriousness of the situation can be determined. Such facts are necessary, of course, in order to know the extent of the problem and must be available to design engineering control. The costs for process improvement and for the purchase, installation and operation of control equipment can be estimated. The number of persons involved in the pollution episode may be determined and the potential cost of litigation and damage claims can be quite closely estimated.

A series of conferences called to present the facts is the second step. They will include company personnel representing legal, public relations, production, insurance, claims, medical, industrial hygiene, engineering, re-

search, safety and budget. As a result of conferences, a plan of action should be authorized and then executed. If the facts, thus presented, do not speak for themselves, then eventual litigation will. Many pollution problems can be evaluated by the above techniques and, when presented in such conferences, each company department may learn how the problem affects them and can determine its particular responsibility. Published reports of the conferences and the decisions made may be circulated to increase company-wide awareness of pollution problems. The philosophy of the new industrial approach to pollution abatement should be stressed throughout these conferences and reports until it becomes a generally accepted part of company thinking and the basis on which decisions are made.

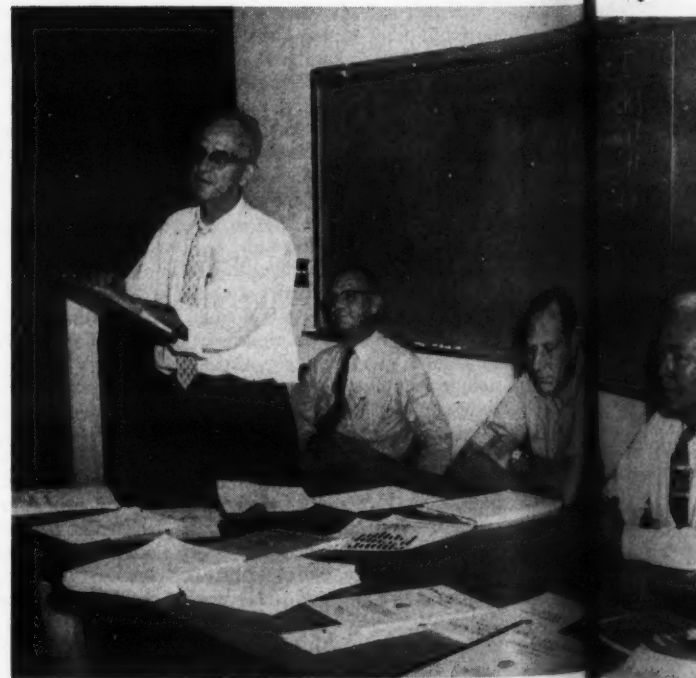
The procedure of securing facts and presenting them for open discussion has resulted in interest and action in our company. By this process a continuing experience is had by all concerned in gaining information and in becoming aware of the total pollution problem within the company. At the same time, something is learned about the problems of others in the industry. Interest and understanding have spread to the point where it is generally recognized that scientific facts can be obtained to tell us that we either have a pollution problem and that it is possible to find a solution and apply control, or that none exists. Also, it becomes generally realized and accepted that it is possible and desirable to abate a nuisance before it occurs when designing and constructing new plant facilities. By this preventive procedure we are not forced to curtail or stop production due to litigation.

## Active Public Relations Program Is Important

A very necessary, immediate and corollary step is to tear down the fence created between industry and the general public on this problem. The mystery, grown out of lack of information and through misunderstanding, may be dispelled by a vigorous pub-

To page 40

# Ten-point pollution control program in action:



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**A) Control pollution before it happens:**

Author Bradley (right) goes over blueprints of pollution control at Cyanamid's Lakeland, Fla., phosphate plant with phosphate operations manager Arthur Crago (center), and plant agriculturist Hoyt Charles

**B) Let others know of your progress:**

Leaders of Florida's industry take a cooperative approach to pollution questions at a conference arranged by office of David B. Lee, director, Bureau of Sanitary Engineering, Florida State Board of Health. Here, a Cyanamid engineer, L. L. Hedgepeth, outlines his company's pollution control measures in Florida to a group of 60 industry representatives. Behind him are Lee, Dr. Harry Gehm, technical advisor to the National Council for Stream Improvement, and L. W. Warrick, chief, Division of Water Pollution Control, US Public Health Service

**E) Direct sampling:**

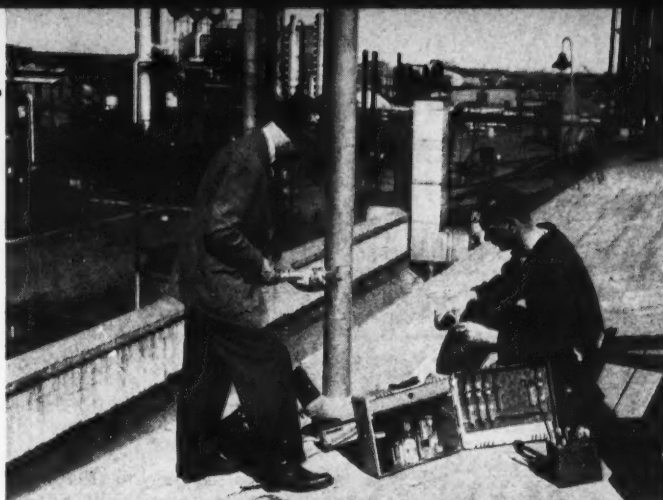
Effectiveness of control program is constantly checked by sampling from plant's stacks

**D) Day-to-day checking:**

At Brewster plant, Dr. W. A. Rye (left), resident physician, and Hoyt Charles, plant agriculturist, check results from continuous, automatic sampling equipment

**C) Work with your neighbors:**

Typical industrial representatives at a state-wide Industrial Waste Workshop in Lakeland, Fla., are (left to right) E. M. Powell, Cyanamid's Brewster plant; C. D. McDowall, J. C. Kennon, and J. R. Terry, Davison Chemical Co.; J. S. Gruel, American Agricultural Chemical Co.; and C. F. Peters, Davison Chemical Co.



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## Pollution Control

From page 37.

lic relations program. But such a program must be supported by accomplishment or community hostility will only increase.

One steel company now enjoys excellent community relations although still faced with an incompleting air pollution control program. They early told their neighbors. We have a difficult air pollution problem from our steel furnace stacks. Our research shows that we can control each stack at a cost of one-half million dollars. This we are doing, one at a time, and have budgeted funds accordingly." Their public relations program continues: "Today we have controlled half of the stacks. We expect to complete this program within the next five years." The public likes this frank cooperation.

Another steel company had the same air pollution problem but never said a word to their neighbors. In fact, they had not spoken to them for many years. What they did was their own business and the public was not welcomed inside their gate. However, they controlled all six of their furnaces at one time but still did not publish their accomplishment. Today their neighbors continue to cite them as a bad actor whenever air pollution is mentioned. Such case histories are useful in stimulating interest in air pollution abatement, but many seem to have a sad, costly ending.

### New Philosophy at Work

Company-wide interest in pollution abatement has been developed within American Cyanamid Company. Having accepted the modern philosophy outlined above, we are enjoying a rather comfortable feeling with respect to this problem. We can live with our neighbors and with existing or proposed legislation. One example may indicate the situation. A decision was made even though there existed at that time the prospect of litigation from potential air and stream pollution.

Rather complete air and stream pollution abatement

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Check 1770 opposite last page.  
CHEMICAL PROCESSING



facilities were designed into the blueprints of the proposed new plant and were installed accordingly. One year before production was anticipated a five-year study was begun combining continuous air and stream sampling together with the collection of meteorological data. This was done to determine the quality of the general area environment and as a check on future plant operation.

An effective public relations program begun at the same time continues to pay valuable dividends in preparing the acceptance of this new plant as a good neighbor. Co-operation with State and Local authorities continues. The ten steps in the philosophy above listed are being followed. This modern positive approach with company-wide interest and support stands as a good example in air and stream pollution abatement that is receiving wide approval. ■

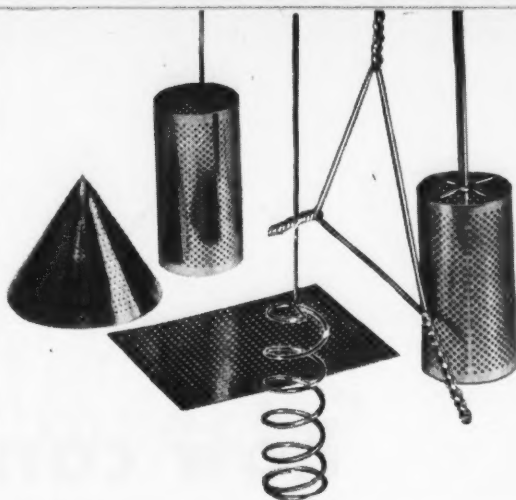
#### Enter Consumer Markets?

From page 31

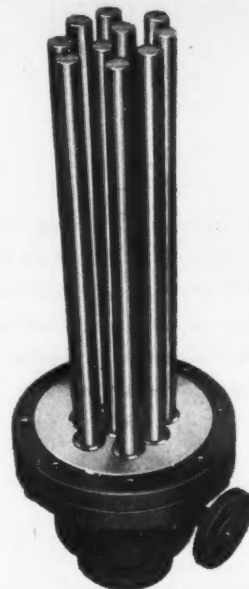
combine them. RCI would buy a phonograph record concern which would be an outlet for one of our products.

To be successful in the recording business you need more than chemicals, of course . . . you must have artists to make the records. I felt that I could persuade a number of the personages of my acquaintance in the music world to record for this company we would buy. The whole idea was highly tempting — especially the prospect of operating with our own materials — but the final decision was "no." Having resisted that particular consumer product, it is hardly likely that we will succumb to another.

Certainly, there are some benefits to be derived from entering the exciting consumer field. However, when one weighs these benefits against the many disadvantages that would result from such a venture, it would appear that the decision to remain in one's own field is the wiser choice. ■



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Check 1771 opposite last page.



Many insect species are developing resistance to certain insecticides. Although we have made tremendous advances in discovering new bug-killing materials, we are barely one step ahead of many of our insect enemies. Here is a big challenge to the chemical industry . . . finding answers to the question . . .



## how can we beat res



USDA Photo

The awful truth is that more and more insects which cause crop damage or which annoy or transmit disease to man and animals are becoming resistant to the effects of insecticides. In time, many more of our destructive insects will become resistant to the chlorinated hydrocarbons and organic phosphorous insecticides — the two main classes of present-day insecticides.

There is an ever-increasing need for basic information on the development of resistance in insects so that the best ways of overcoming it may be found. This is a very complex problem. We must support programs of physiological and chemical research to learn more about the nature of resistance and also to correlate this information with additional entomological findings under field conditions.

### What Could Happen

If we don't do this, the results could be very serious. Just imag-

ine what will happen to our economy if the resistance of the boll weevil to chlorinated hydrocarbon insecticides continues to spread throughout the cotton belt.

In 1955, resistance first showed up in small areas. The very next year, over half the cotton acreage in Louisiana, and localized areas of Texas, Arkansas, Mississippi, and South Carolina were reported as being affected.

In addition to this threat, a number of other cotton insects are becoming resistant to chlorinated hydrocarbon insecticides, and there is a possibility that resistance may become general.

The impact upon the cotton industry — and the chemical, paint, synthetic fiber, and agricultural chemical industries which depend on cotton — would undoubtedly be serious.

Also of great concern are losses and many problems likely to result because of the development of resistance to insecticides by an increasing number of de-

structive pests of fruit, vegetables and other crops.

**House Flies** — When DDT was first introduced in 1945, its success against house flies was phenomenal. Within five years, however, flies became so resistant that in many localities DDT had little effect. Next, DDT-synergist combinations were tried, and with success at first. But it did not take long for flies to become resistant to these combinations.

Other chlorinated hydrocarbons were tried, but the house fly became resistant to them. Organic phosphorous insecticides were developed and several are now used successfully as baits and as residual sprays. Some are so toxic to man, however, that their major use is in baits. Development of additional safe sprays is under way.

**Flies Affecting Livestock** — Chlorinated hydrocarbon insecticides (such as DDT, methoxychlor, and toxaphene) give excellent control of horn flies. However, they are not very ef-

fective against stable and horse flies. The need for substitute materials is not acute for use on beef cattle, but new insecticides which will not secrete in milk are urgently needed for horn fly control on dairy cattle.

The search continues for better and safer materials and methods of controlling biting flies. As new compounds are found effective, additional studies will have to be made to determine whether residues occur in meat and milk.

**Mosquitoes** — In 1949, DDT became ineffective in controlling adult salt marsh mosquitoes in Florida. A few years later, lindane also became ineffective in many parts of Florida and California. In Bolivar County, Mississippi, the malaria-bearing mosquito has become difficult to control with chlorinated hydrocarbon insecticides. Recently, however, mild phosphorous-containing insecticides (malathion and Chlorthion) have been found effective against several species.

Mosquito control is complex

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# eat resistant insects?

**C. H. HOFFMANN**, Assistant Director  
Entomology Research Division  
US Department of Agriculture  
Beltsville, Maryland



Dr. C. H. Hoffmann, Assistant Director Entomology Research Division, Agricultural Research Service, United States Department of Agriculture, directs research programs to develop chemical and other methods of controlling insects that destroy crops and those that adversely affect man and animals, and to protect beneficial insects. These investigations are conducted at 112 laboratories throughout the United States and abroad.

Dr. Hoffmann is a trained entomologist who joined the Department in 1935. He has had considerable field experience in research on forest and field-crop insects. Since 1950 Dr. Hoffmann has directed entomological and chemical research studies.

and requires a number of approaches. An effective larvicide is under development. Over 700 new compounds were tested — and only four were found to be toxic at concentrations of 0.1 ppm or less. Of these, one was too hazardous to man to use. Field evaluation of the other three is under way.

Use of granular insecticides is also under study, and has proved successful in many areas.

**Cockroaches** — Resistance of roaches to DDT, Chlordane, and lindane began five years ago and has since spread across the country. During the past two years, excellent progress has been made against roaches. Malathion, Chlorthion, Diazinon, and Difterex have proved effective. Others are under test.

**Bed Bugs** — At first DDT was an excellent killer, but by 1950, bed bugs started to become resistant. Lindane was tried and worked for a few years. Presently, malathion is an effective substitute. Last year other or-

ganic phosphorus materials were found effective: Diazinon, Difterex and Chlorthion.

**Fleas** — Recently these insects have been gaining resistance to DDT, Chlordane, and lindane. At present, malathion is recommended for control. Other chemicals are under test.

**Human Lice** — Although of minor importance in our country, lice are still a serious menace to health in other parts of the world, especially in many places where US troops are stationed. In some areas lice are becoming resistant to DDT and lindane. Pyrethrum louse powder is the only other material presently available, but this does not have the long residual effectiveness necessary to eradicate infestations.

Research is continuing. About 1000 chemicals are being screened each year for toxicity to lice — and last year, only 50 proved effective. The majority of these were ineffective when tried as powders. Some were dropped

because they were toxic to humans. At present, hopes are pinned on malathion used in low concentrations.

Synergists for pyrethrum and allethrin are also being evaluated. Over 100 potential synergists are evaluated annually.

## What Can We Do? — A Challenge

A broad research program is required if entomologists co-operating with the chemical industry are to meet this challenge. The mode of action of insecticides and the mechanisms through which insects become resistant must be studied. We must learn ways to quickly recognize when a pest develops resistance.

Continuing studies of all possible compounds should be made to determine their effectiveness as insecticides. The effectiveness of two or more insecticides — used both alternately and in combination — that have different modes of action should be

studied. Use of synergists to combat resistance must be studied thoroughly.

A phase of research which is proving to be of value is the development of cultural control practices and biological control agents, such as parasites, predators, and disease. We must study the selective control of insects.

If the insecticide industry and agriculture are to gain the full benefit of all latest developments, there must be an improvement in the distribution of insecticides. Supply outlets must have the latest recommended materials available as quickly as possible.

Although we have made tremendous advances in the discovery of new materials and in the use of alternative insecticides for the control of many insects that have become resistant, nevertheless these certainly are only stop-gap measures and we are barely one step ahead of many of our insect enemies. We must work, and work hard to win this battle against insects. ■

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Check 1772 opposite last page.

## Chemistry and the Atom

From page 36

standardization and large runs.

Also, it is difficult to determine today what the overall processing volume of irradiated fuel elements is likely to be for an industry that is still in its infancy.

In view of these obvious difficulties, is it likely that private companies will enter the field of fuel element processing? A policy aimed at having commercial chemical plants ready to process spent fuel elements from the first privately owned power reactors, was announced by the Commission on January 5, 1956. Later in that month, the possibilities were discussed at a chemical processing meeting at Idaho Falls, Idaho, attended by 183 representatives of business firms. The talks centered on the effect of cost factors in chemical processing on economical operation of reactors.

In the January 1956 announcement, the AEC stated that proposals would be invited at a later date for design, construction, and operation of chemical processing plants. The Commission would also permit the use of its laboratories on a reimbursable basis for development work by those companies whose proposals were accepted, and would supply the plants with an initial base load of spent fuel. Meanwhile, interested firms are being furnished with information on technology, fuels available, costs and so on, to help them prepare proposals. We feel certain that a few companies will have the enterprise and imagination to figure out for themselves how to make a success of what is clearly a very difficult business. The possibility exists that a considerable portion of irradiated fuel element processing costs can be offset by developing a market for the by-product radioisotope materials now considered to be the wastes of nuclear fission.

It is recognized that several years will elapse before commercial processing plants can be put in operation. Pending the establishment of commercial services to do the work, the AEC will provide chemical processing services for pri-

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#### Other Technological Problems

There is need to develop more economic methods of reducing high-grade uranium ores, and of preparing and purifying concentrates. Further, as the years go by, it is likely that we will have to recover uranium from shales and other low-content ores. It is almost axiomatic that a method of chemical treatment that is satisfactory for high-grade pitchblend, the principal present source of uranium, is not likely to be satisfactory for a low-grade carnotite. To learn to do the processing job efficiently and economically with low-grade ores, is a real challenge to chemists and chemical engineers. A related problem is the need to develop facilities to process thorium, convert it to fissionable uranium-233, and put the uranium-233 into the nuclear fuel chain.

Of increasing importance to the development of economic nuclear power reactors, is the problem of recycling plutonium or uranium-233 to either the reactor where it was produced or to another reactor. Except for their weapons value, these materials are not worth recovering unless we can learn to use them as reactor fuels. This we must do, for we simply cannot afford to burn up uranium-235 without any regeneration of fissionable material. Although these recycling problems are largely metallurgical, they have many chemical aspects and are tied in with the chemical processing of irradiated fuel.

A specific problem for the chemist in the case of plutonium is to gain a knowledge of the properties of alloys and compounds for the purpose of developing fuel elements containing plutonium. This requires a greater knowledge than we now have of the properties of many alloys and compounds, their phase diagrams, thermodynamic properties and so on. Further, the chemist must develop ways of fabricating plutonium despite its extremely poisonous char-

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VINELAND, N. J.

Check 1773 opposite last page.

## Chemistry and the Atom

*From preceding page*

acteristics which make remote handling mandatory.

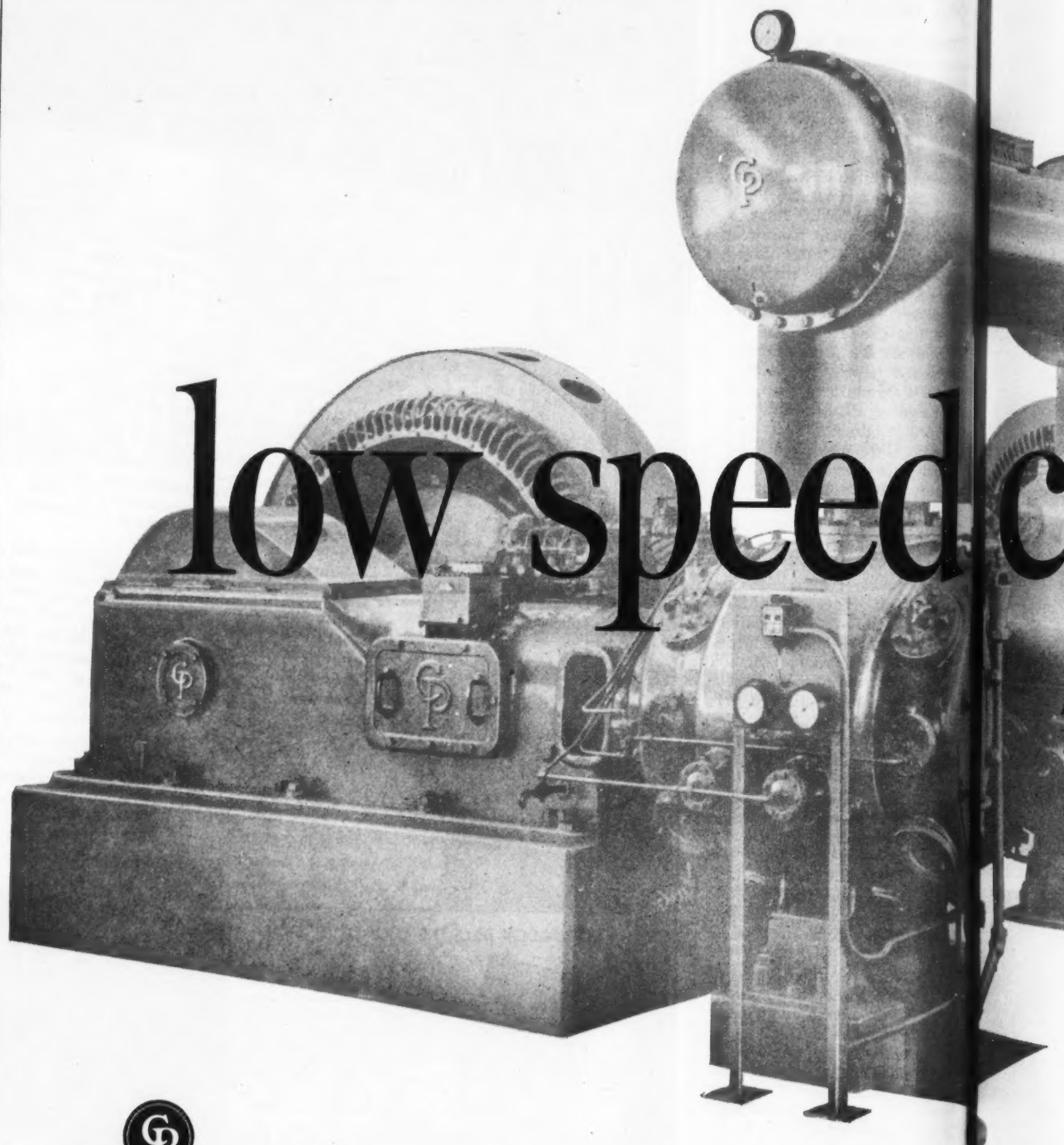
Chemical engineering and chemistry also have major contributions to make to the solution of problems other than those related to the nuclear fuel chain. Some of these problems are related to heat transfer and fluid mechanics in the reactor core and associated equipment. Others arise from the detrimental effect of corrosion and radiation on engineering materials used in reactor construction. Still others are concerned with the decomposition of coolants and protective films within a reactor.

An understanding of the basic nature and underlying causes of corrosion and the fundamental mechanism of radiation-induced effects on materials in a variety of coolants and atmospheres is necessary so that we can reduce the effects of radiation and corrosion in specific situations. When we possess this understanding we will be in a position to select materials which will withstand exposure to the radioactive and corrosive atmosphere of power reactors operating at the high temperatures necessary for efficiency.

The chemical phenomena involved in potential reactor hazards present another fertile field for problem solution. Many unexpected events can occur in reactors as a result of chemical reactions, for example, as between claddings and fuel on the one hand and coolants and air on the other, or between various other materials in the reactor. For many reactors the energy released in such purely chemical reactions might be greater than would result from any foreseeable nuclear excursion. In other cases, some of the possible chemical effects, such as the formation of low-melting eutectics, may be utilized as safety devices. Solutions to these problems require chemical, thermal, and fluid-mechanics data which are not yet available.

Chemists and chemical engineers are also faced with the problem of treating, handling, and disposing of waste fission products and other radioactive

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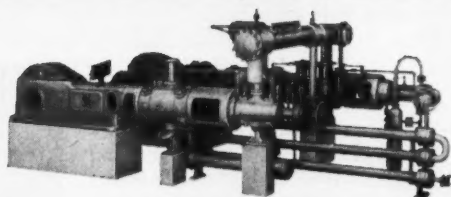
*Class*

**O**

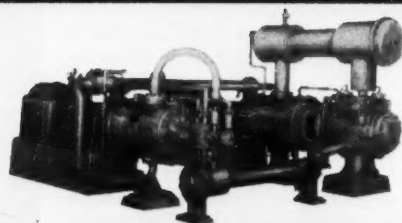
- FOR PRESSURES TO 15,000 PSIG
- SIZES 200 TO 1000 HP  
(other CP Compressor models available in sizes up to 5000 hp)

# Class O compressors

*for maximum availability*



Class OCE-5 five-stage, horizontal duplex ethylene gas compressor.



Four-stage Class OCE-4, slow-speed compressor handling hydrogen at 3000 psig.

Check 1774 opposite last page.

debris. Commercial reactors will produce large volumes of this material. The present method of tank storage is neither adequate nor permanent. Intensive study is in progress to develop more economic and positive methods. At the same time, considerable attention is also being given to utilizing wastes for useful purposes (CHEMICAL PROCESSING, October 1957, page 52.) Chemical treatment will be required for the achievement of such applications.

## Men and Atoms

At this time, chemists and chemical engineers constitute about 30 percent of all scientists and engineers engaged in nuclear energy work. Like scientific and engineering personnel generally, the bulk of the chemists and chemical engineers in the nuclear field are employed by industry; only three percent work for the Atomic Energy Commission. As time goes forward it seems likely that more and more chemists will be required to meet the demand of an expanding nuclear power industry. Thus, a shortage of chemical manpower may constitute a major problem in the nuclear field.

## It's A Two-way Street

From the foregoing it is obvious that chemistry's role is of major importance to the continued development of atomic energy. Reciprocally, nuclear energy has had, and without doubt will continue to have, profound effect on the

To page 307

## Chemical Company



"This is one of our more hazardous areas."





CP Staff Photo  
Spray-dried product (right) is about 40% bulkier than powdered material. Each bag contains 100 lb net

Switch in drying technique gives "new look" to some established products. Smaller bulk density, higher tri-poly content, and greater solubility result in stepped-up demand for . . .

## spray-dried sodium phosphates

TED F. MEINHOLD, Associate Editor  
With T. W. SCHILB, Vice President  
Shea Chemical Corporation

Spray-dried sodium phosphates — sodium tripolyphosphate and tetrasodium pyrophosphate — introduced only a few years ago, are rapidly making a name for themselves. Sales are booming and demand keeps growing. Biggest factor seems to be the ever-rising use of consumer-type detergents, in whose formulas these products play a leading role.

The spray-dried material, with its granular, air-filled characteristics, has a number of advantages over the conventionally-dried powdered product. For one thing, its bulk density is lower — the granular product being 40 to 50% larger than the powdered material. When dry mixed with the other ingredients in the detergent formula, this adds 10 to 20% more to the size of the final packaged consumer product — making it much more appealing to the shopping housewife.

Being practically dust-free, the spray-dried phosphates eliminate a number of processing headaches. The greater surface area also results in their dissolving 25 to 30% faster.

### Higher Tri-poly Content

Another advantage — and this has not been often publicized — is that spray drying produces a

sodium tripolyphosphate with a higher tri-poly content. Tri-poly is formed when two molecules of disodium phosphate combine with one molecule of monosodium phosphate. However, disodium phosphate, being less soluble, has a tendency to separate, and become tetrasodium pyrophosphate. In the spray dryer, almost instantaneous drying reduces separation and creates a higher percentage of tri-poly — less going to pyrophosphate.

Tri-poly content is becoming an increasingly important factor as the market becomes more competitive. Conventionally-dried sodium tripolyphosphate, which used to have about 88-92% tri-poly content, is now up to 92-95%. The spray-dried product ranges about 97-99%.

### Pioneering Done in 1954

Spray-dried polyphosphates were introduced commercially by Shea Chemical Corporation in November 1954. Shea, one of the youngest and fastest-growing producers of phosphorous and phosphorous compounds in the US, was incorporated in 1952, and since that time has added a major plant at the rate of about one a year. Three plants — at Jeffersonville, Indiana; Dallas,

Texas; and Adams, Massachusetts — have been built to produce sodium phosphates.

Jeffersonville is the largest of the company's phosphate plants, producing about 75,000 tons per year. Company uses the conventional process for making the sodium phosphates — that is, by mixing phosphoric acid with soda ash, heating to 300-500°C to produce desired reactions, and then drying and milling product to specifications. Shea produces its own phosphoric acid, but purchases soda ash.

### Build Own Plants, Spray Dryer

Unique feature of the Shea organization is that it designs and builds all of its plants. This results in savings in both construction time and costs, according to the company.

Spray dryer at Jeffersonville is of a single-shell design measuring 22' in diameter by 57' high. Heat is supplied by a gas-fired horizontal combustion chamber located at top of dryer. Furnace develops 30 million Btu per hour — enough to evaporate over 10 tons water per hour. Heat passes into top of spray chamber by means of duct system. Temperature of air leaving combustion

chamber ranges from 400 to 700°C. Off-gas temperature is about 100 to 200°C.

Spray dryer is constructed of mild steel, except for the high-temperature zones, which are made of 304 stainless. Air is supplied by means of a large blower handling total of 50,000 cfm. Pressure drop across spray dryer system is about 12" water gage. Feed slurry is fed into dryer at rate of 10,000 to 18,000 lb/hr (dry basis) by 600-psi triplex positive-displacement pump.

To page 30



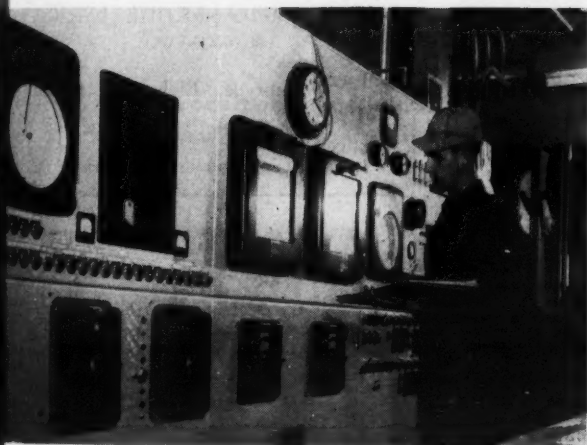
CP Staff Photo



NEW SOLUTIONS  
of processing problems



Jeffersonville is largest of company's phosphate plants, producing about 75,000 tons per year. Spray dryer tower is at right



Spray dryer (right) is of single-shell design measuring 22' diameter by 57' high. Horizontal combustion chamber can be seen at top

Operation of spray dryer is controlled from centrally-located board



Part of finished product is sent from calciners directly to bagging machines



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### VACSEAL PUMP

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**\*26th Exposition of  
Chemical Industries**

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BOOTH 1054

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SP 505

Check 1775 opposite last page.

## Spray Drying

From preceding page

Dried product, containing less than 5 percent moisture, is withdrawn continuously from bottom of dryer. Off-gas passes through series of dust collectors and scrubbers where over 99% of entrained solids are recovered. Dryer can be switched from drying sodium tripolyphosphate to drying tetrasodium pyrophosphate — or vice versa in about 3-4 hours.

After leaving spray dryer, phosphates are sent to huge rotary calciners, where the orthophosphates, which are produced in spray dryer, are converted, through molecular dehydration, into polyphosphates. Final specifications for spray-dried products are as follows:

	Na <sub>3</sub> P <sub>3</sub> O <sub>7</sub>	Na <sub>2</sub> P <sub>2</sub> O <sub>7</sub>
Bulk density (lb/cu ft)	36	34
On 20-mesh screen	0	0
Through 100-mesh screen	5.0	10.0
P <sub>2</sub> O <sub>5</sub> (%)	53.5	57.5
Na <sub>2</sub> P <sub>2</sub> O <sub>7</sub> (%)	99.5	1.5
Ortho (%)	0.1	nil
Insolubles	clear	clear
pH - 1% solution	10.1	9.9

Powdered forms of the phosphates, for use in certain industrial-type cleaners, are made simply by milling the spray-dried product to the desired screen sizes.

Finished phosphates are sent to storage tanks or fed directly to bagging machines or into hopper cars for shipment. Pneumatic conveyor carries material from storage tanks into hopper cars.

(Further information on sodium phosphates may be obtained from Shea Chemical Corporation, 114 East 40th Street, New York 16, New York.)

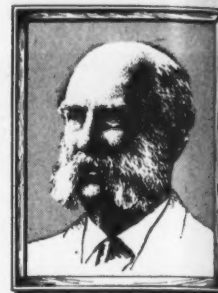
Check 1776 opposite last page.

## Development center

Company's enlarged engineering development center designed to serve process industries is described in illustrated 16-page booklet. Development Center Booklet — The Lummus Co., 385 Madison Ave., New York 17, N.Y.

Check 1777 opposite last page.

Excerpts  
From The  
Chemical  
Hall of  
FAME



## James Mason Crafts (1839-1917)

In 1911 Crafts was awarded the Rumford medal by the American Academy of Arts and Sciences for his investigations into thermometry that were so accurate they are still regarded as classics.

By 1911 Foremost's El Dorado Division had been stressing purity and uniformity in their production control for nearly two decades.

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Check 1778 opposite last page.

CHEMICAL PROCESSING





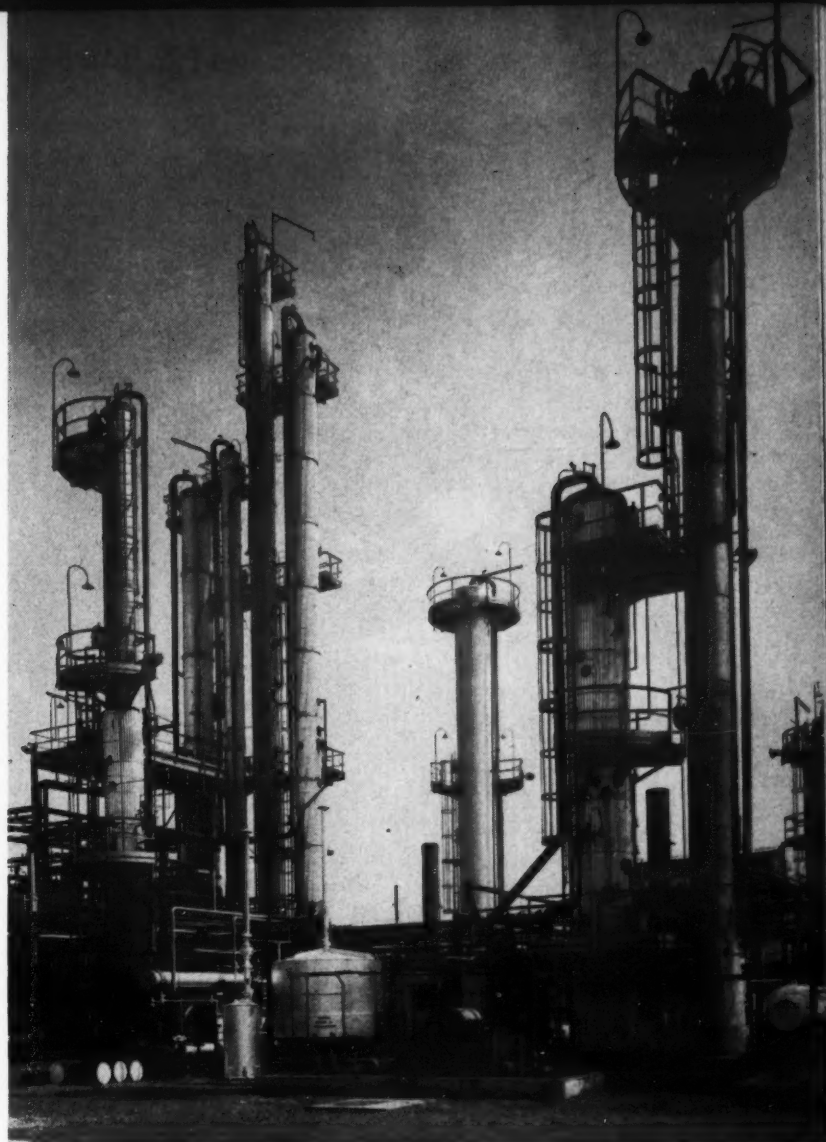
**ERIC H. REICHL** has been Director of Research and Development at Pittsburgh Consolidation Coal Co. at Library, Pennsylvania, since 1954. He joined the company in 1948 after serving with the California Research Corp., Stanolind Oil and Gas Co., Koch Engineering Co., and Babcock and Wilcox Co.

He holds a masters degree from Technische Hochschule in Vienna, Austria.

## Coal chemicals outlook: cloudy and cold

**Coke production is tied in with steel making, not demand for coal chemicals**

**ERIC H. REICHL** Director  
Research & Development Division  
Pittsburgh Consolidation Coal Co.  
Library, Pennsylvania



Pitt-Consol Chemical Company's chemicals-from-coal plant in Newark, N.J., now runs on oil

In a way, the story of coal chemicals is the story of the tail wagging the dog. It would take more than a 100% increase in the demand of coal chemicals to even affect the present amount of coal being coked.

The reason? Coal chemical production is tied directly to the amount of coke needed for steel making, it takes about 1700 lb of coke per ton of steel, and many mills are finding ways to reduce this down to 1300 lb and less by upgrading the iron ore.

Of the coal tar that is produced, only half is processed to recover coal chemicals. The rest is used as tar or pitch or burned. Tar

and pitch are two of the few coal chemicals which cannot be made catalytically from petroleum.

The only significant incentive to growth for coal uses other than that of generating steam is its use in making gases or liquid fuels. But what happens here depends entirely on our oil and gas reserves and the costs of production. We can see the economics behind the first commercial liquid fuel from coal plant, now on-stream in South Africa. Here the operation is feasible because gasoline costs 70c per gallon, and coal only costs 75c per ton.

It will be at least 10 years be-

fore coal-based synthetic fuels can even begin to become a reality in this country. When they do, the impact on the chemical industry will be large.

### Direct Production of Chemicals

Success has been sought by means to produce coal chemicals from coal directly without accompanying production of fuels. Examples: the German Synol process and Union Carbide's work on hydrogenation. To date they have not been commercially applied in the United States.

Use of low-temperature carbonization — low temperature

means that destructive distillation of coal is handled at about 1000°F lower than in coke ovens — stands an economic chance and it can be tied to generation of electric power not steel. This will give stability to the operation, but at present, it is at best a marginal operation.

In any event, the big future for coal lies in the huge increase in demand for power and beyond that a potential demand for synthetic fuels. As a by-product from these, coal chemicals can have a spectacular growth, but coal chemicals by themselves cannot result in a significant increase of our coal production. ■



A black and white aerial photograph of New York City, showing a dense urban landscape with numerous skyscrapers and buildings. In the center of the image, a large, light-colored building with a distinctive stepped-top design is highlighted, representing the New York Coliseum where the 1957 Chemical Show will be held. The surrounding area includes various other commercial buildings, streets, and some green spaces.

*A Preview . . .*

# THE 1957 CHEM SHOW

## New Product Ideas You Will See

The 26th Exposition of the Chemical Industries moves from Philadelphia back to New York this year—to the New York Coliseum where it will occupy all four floors. The show, with more than 550 exhibitors, will run from December 2 through 6.

CHEMICAL PROCESSING's editors queried exhibitors as to NEW products or IMPORTANT modifications they plan to INTRODUCE at the show.

Here is a summary of what they found out.

### Processing Equipment

A considerable amount of emphasis will be placed on size-reduction equipment at the show. *Fluid Energy Processing and Equipment Company* will exhibit their recently developed Jet-O-Mizer double separation mill, which may open up new fields for extremely super-fine products. The company will also demonstrate a double-opposed grinding mill, specifically designed for grinding abrasive-type materials.

*Rietz Manufacturing Company* will display a modified version of their Disintegrator. The company will also show their new Extructor, a continuous paste mixing and extruding device which works on the principle of rotating blades and stationary plows continuously mulling, mixing, and kneading material as it progresses through unit.

*Chemicolloid Laboratories, Inc.*, will introduce a new colloid mill. Entire milling head can be removed for sterilization. Cooling chamber surrounds head. Com-

pany will also exhibit a package-type mill for processing sterile batches of injectible materials.

*The Strong-Scott Manufacturing Company* will show a new triple-action blender. Unit has an agitator assembly consisting of a center spiral and two ribbons that mix, blend, and fold every particle thousands of times each minute. Company will also exhibit, for the first time, its new high-speed mixer—the Turbulizer. Another product to be exhibited by the same firm for the first time is the Pulvocron—a high-precision fine-grinding machine with internal air classification.

Hydraulically-adjusted three-roll mills with roll-pressure indicating gages will be featured by *Charles Ross & Son Company*. New mills have one-point hydraulic adjustment which simplifies setting and assures uniformity of product with minimum maintenance. Double-planetary change-can mixers will also be shown.

*Hardinge Company, Inc.*, will display five working models of their industrial process machinery. Major display item will be a complete dry-grinding system, including a new disc-roll mill and Gyrotor air classifier.

A new heavy-duty centrifugal

The Chemical Exposition will occupy four floors in New York City's Coliseum (light building in center)

CHEMICAL PROCESSING

NOVEMBER



impact mill and centrifugal mixer will be demonstrated by *Entoleter Division of Safety Industries, Inc.*

*Tri-Homo Corporation* will show their new Paint Master size-reduction unit. Mill has a ceramic rotor and stator.

In case you are interested in fluidized drying, don't miss *General American Transportation Corporation's* pilot plant fluidized-bed drying system. They also plan to show an RDC column designed specifically for counter-current washing of solids.

*The Pfaudler Company* will display its new line of "R" series glass-lined reactors. In addition, a 12"-diameter alloy wiped-film evaporator will be exhibited. Company will also be operating its Titan centrifuge, illustrating a unique principle of automatic and periodic desludging.

A new Spinning Band distillation column will be shown by *M. J. Seavy and Sons*. This column is designed to provide large throughputs under high vacuum, with high efficiency.

*Falls Industries, Inc.*, will feature a completely redesigned distributor head for their standard Impervite HCl absorber. Head is said to provide better distribution and equalization of both liquid and gas flow.

If high-pressure autoclaves interest you, you'll want to visit the booth of *Pressure Products Industries* where units designed to withstand pressures up to 1000 psi will be demonstrated. The autoclaves have agitators with speeds up to 10,000 rpm.

For distillation experts, *Misco Fabricators* will show a ten-minute film on the newly designed Uniflux fractionating tray patented by Socony Mobil.

A major improvement in tower distributors will be shown by *The U.S. Stoneware Co.* "Multi-level" for low liquid rates and "Weir-flow" for medium-to-high liquid rates. A metal Pall ring for tower packing will also be exhibited.

Water still that never needs cleaning will be exhibited by *Barnstead Still & Sterilizer Company*. It produces extremely pure water with resistance in excess of 600,000 ohms. Company will also display a distilled water tank designed to maintain sterility of the water. Tank has ultraviolet

light mounted above water.

## Filtration Developments

In the field of filtration, a new vertical-leaf-pressure filter in a horizontal cylindrical tank will be shown by *T. Shriver & Company*. Unit can use any type of filter media. Leaves are readily movable so that leaf spacing can be adjusted as desired.

*Hercules Filter Corporation* will exhibit their Rapidor pressure-leaf filter, fitted with a mechanized leaf pack extractor and vibrating shaker for quick cleaning. Company will also show its Roto-Jet self-cleaning filter. Unit has conical design, fitted with Lucite door and internal rotatable header. Filter designed for filtering corrosive liquids will also be featured.

A new development in the field of filtration will be introduced by *Croll-Reynolds Engineering Company, Inc.*: a new tubular-element filter membrane. Company says that design is such that top performance can be achieved with significant reduction in cost.

New concept in fastening and tensioning of filter cloth in filter leaves will be demonstrated by *Multi-Metal Wire Cloth Company, Inc.* Method does away with welding, soldering, and riveting. Company will also exhibit ultra-fine metallic filter cloth, with particle retention as small as 10 microns. Novel electro-

### HOURS:

**Opens Monday, December 2, at Noon; 10 A.M. every day, Tuesday through Friday, December 6.**

**Closes 6 P.M. on Tuesday, Wednesday, and Friday; at 10 P.M. on Monday and Thursday.**

### ATTENDANCE:

**Estimated at 35,000 to 40,000.**

deposited metallic filter medium will be shown. Made of pure nickel, it provides freer filtration and has less tendency to clog.

Two new pieces of equipment are going to be shown by *Ertel Engineering Corporation* for the first time. One of them is a 7"-diameter enclosed-cylinder disc

filter, constructed of 304 Stainless Steel. Unit is specially designed to handle volatile solutions. Other item is a straight-line semi-automatic vacuum bottle filler.

*Terriss, Division of Consolidated Siphon Supply Company, Inc.*, will exhibit filtration equipment designed to give maximum filtration area in smallest possible floor space. One piece displayed will have 6 sq ft of filtration area in floor space of only 6 x 6".

Platinum and precious-metal filter discs and sintered precious metals used as catalysts and filter media will be exhibited by *J. Bishop & Company*.

*The Filterite Corporation* will introduce their new line of cartridge filters. Cartridges are made from a variety of fibers, such as cotton, Orlon, Dynel, nylon, and glass. Units are wound in various densities, with particle selections available from 100 microns down to 1 micron.

## Dryers

An example of the continuing developments in the field of drying will be shown by the *Jeffrey Manufacturing Company*. Two new products will be exhibited for the first time. They are: 1) two-zone direct-air dryer with variable-speed mechanical vibrating drive, and 2) a new compact unit heater complete with steam coils, and air-temperature and volume indicators.

*The Patterson-Kelley Company, Inc.*, will feature a new double-cone vacuum dryer.

*C. G. Sargent and Sons Corporation* will exhibit their pilot plant dryer. This is the unit's first public showing.

A new vacuum shelf-dryer will be exhibited by *F. J. Stokes Corporation*. Unit can be arranged for heating by hot water, steam, or special heat-transfer fluids. All manifold connections are outside of chamber, avoiding risks of leaks and possible product contamination. Company will also demonstrate an automatic stoppering device that sets and seals stoppers of small bottles as they are being processed.

In the field of dust collections, *The Day Company* will have a combination cyclone and filter within one compact round housing. High air-to-media ratios are

possible. *Duster Corporation* will show, for the first time at any exhibit, its new D-584 dust collector. *Pangborn Corporation* will exhibit its new Ventrijet wet dust collector.

*Baker Perkins Inc.* will exhibit their Ko-Kneader and a newly developed auxiliary power feeder and power granulator. Machinery is designed for various continuous mixing operations.

*Infilco Inc.* will feature their

### WE'LL BE THERE

**look us up in booth 880**

**CHEMICAL PROCESSING** editors will be at the show, of course, and this would be a good chance for a reader-editor "chinfest." Let's exchange ideas . . . maybe we can help each other.

**Remember . . . it's booth 880.**

*Viscomatic lime-slaker* and a new twin-throat venturi. Venturi is designed to measure higher dynamic pressure than is possible with a conventional venturi tube. It is a differential pressure producer for flow measurement which operates at a particularly low pressure loss.

## Separators

In the field of entrainment separators, *Otto H. York Co., Inc.* will introduce a new demister for applications where very high entrainment separation efficiency is required.

Two continuous self-cleaning centrifugal separators will be exhibited by *Centrico Inc.* The *Jet-O-Matic* separates a mixture of two immiscible liquids and simultaneously and continuously discharges concentrated solids which can be recycled to further thicken, if desired. Company's *De-Sludger* separates two immiscible liquids. Larger amount is the light liquid phase which is discharged under pressure. Smaller amount is the heavier liquid phase, discharged by gravity over a ring dam.

To meet the demands for centrifugal equipment that operates at higher pressures and temperatures, *The Sharples Corporation*



# SALTS AND METALLIC SOAPS

FOR CHEMICAL PROCESSING

ACETATES	AMMONIUM ACETATE 50% solution	POTASSIUM ACETATE crystals
	CALCIUM ACETATE powder	SODIUM ACETATE anhydrous
	COPPER ACETATE crystals	SODIUM DIACETATE
	MAGNESIUM ACETATE crystals	SODIUM HYDROXY-ACETATE
	ZINC ACETATE powder	
CAPRYLATES	AMMONIUM CAPRYL-ATE 50% solution	COPPER CAPRYLATE powder
		SODIUM CAPRYLATE powder
	ZINC CAPRYLATE powder	
FORMATES	ALUMINUM FORMATE powder	COPPER FORMATE crystals
	AMMONIUM FORMATE 50% solution	POTASSIUM FORMATE 50% solution
	ZINC FORMATE powder	
GLUCONATES	COBALT GLUCONATE (Co 11%)	FERROUS GLUCONATE (Fe 11.5%)
	COPPER GLUCONATE (Cu 14%)	MANGANESE GLUCONATE (Mn 11.4%)
	ZINC GLUCONATE (Zn 14%)	
LACTATES	ALUMINUM LACTATE powder	
	AMMONIUM LACTATE 50% solution	
	CALCIUM LACTATE powder	
	POTASSIUM LACTATE 50% solution	
	SODIUM LACTATE 50% solution	

The Acetates are widely employed in textile dyeing and stripping; leather tanning; plating; mildew proofing; rosin liming; photography; pigment manufacture; silver polishes; as antibiotic nutrients, humectants and mold inhibitors; in the manufacture of magnesium soaps and in organic syntheses.

Formates are used in textile dyeing; noble metal manufacture; mildew proofing; rubber compounding; water-repellent finishes and as fungicides.

The gluconates are suggested for evaluation as catalysts wherever inorganic salts of the various metals are currently used.

The Caprylates are employed as fungicides and are suggested for evaluation in rubber compounding.

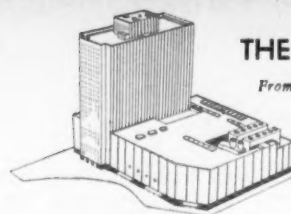
Lactates are used in food processing. The Potassium and Sodium salts have been employed as humectants and plasticizers for casein solutions, in calico printing and as corrosion inhibitors.

**CHEMO PURO**

**MANUFACTURING CORPORATION**

150 Doremus Avenue, Newark 5, N. J.

Check 1779 opposite last page.



## THE 1957 CHEM SHOW

From preceding page

will introduce three new high-speed centrifuges. One, called the P-7000 Super-D-Canter, can handle 200-250-gal slurry per min and operates at pressures up to 150 psi. The DH-6 Nozjector, a differently designed continuous-type unit, can function at pressures up to 50 psi. Third, the P-3000 Super-D-Canter, rotates at 4000 rpm, and is ideal for large-scale dewatering and clarification jobs.

### Mixers

An example of the continuing development of mixing equipment, *Mixing Equipment Company, Inc.*, will exhibit a new mechanical seal which enables user to service or replace seal assembly without dismantling mixer or draining tank contents. Another design permits servicing or repair while retaining full pressure or vacuum in tank.

The *American Well Works* will introduce their low-capacity, single-stage pipeline mixer and also a tank-type mixer developed for continuous dispersion of difficult-to-wet solids. The *T. L. Smith Company of Milwaukee* will exhibit its new turbine mixer. Unit is reported to mix dry materials up to six times faster than conventional models.

The *Blaw-Knox Company* will show a precessional-motion mixer for blending of dry or wet-and-dry materials. One feature is hollow drive-shaft arm through which spray pipe adds liquids to dry material mix. The *Falcon Manufacturing Division of First Machinery Corporation* will exhibit their new sanitary-design ribbon blender.

Of particular importance, and brand new in the industry, is *Chemineer's* experimental agitator. Used together with a mixing handbook and dynamometer stand, it greatly

simplifies mixing scale-up projects.

A pilot plant setup which permits a variety of mixing, extraction, and purification systems is being shown by *Centrico, Inc.* Three centrifuges perform two-stage, counter-current solvent extraction, clarification, or mixing. Desludger for clarifying liquids with a solids content of 2-8%, and a nozzle separator for three-phase mixtures will be exhibited.

*Herman Hockmeyer & Co.* will exhibit three pieces of equipment: 150-gal-capacity horizontal paste mixer, with blade design that gives forced unloading through bottom gate outlet; 60-gal pony paste mixer that combines advantages of horizontal paste mixer with versatility of change can mixer; disperser for cold cutting, dissolving, emulsifying.

Another development in the mixing field is offered by *Tri-Homo Corp.* This unit, for grinding, dispersing, and homogenizing of paint, pigments, lacquer, and paper coatings and all types of emulsions, will be in operation. It's jacketed, has ceramic rotor and stator.

If fungicides are of interest, see the *Chemo Puro Manufacturing Corp.* display on water-soluble derivatives of two fungicides which heretofore have been available only in water-insoluble or water-dispersible forms. They are the sodium salt of salicylanilide and sodium salt of *p*-chlor-m-cresol.

For Mix-Muller users, *National Engineering Co.* will show an elevator-aerator designed to provide a quick, positive means of carrying material from the mixer. Can be arranged to carry material to storage hoppers, conveyor belts, or storage bins.

### Chemical Feeders

There will also be some new developments shown in chemical feeders. *Eriez Manufacturing Company* will display their improved line of HI-VI electro-permanent magnetic vibratory feeders. *Vibro-Screw* will exhibit, for the first

CHEMICAL PROCESSING

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SSING

time, their feeder. Unit was developed especially to handle sticky compounds.

**Prater Pulverizer Company** will announce their new rotary feeder for high-capacity pneumatic conveying. **Kom-line-Sanderson Engineering Corporation** will exhibit a rotating-wheel chemical feeder. Company will also introduce a complete line of custom-designed and standard continuous pressure and vacuum rotary filters.

**Southwestern Engineering Company** will feature their new 30"-diameter vibrating-screen separator. **Productive Equipment Corporation** plans to have three of their Selectro screens operating on static material to demonstrate the use of static removal bars in screening such materials.

In another field, **American Hydrotherm Corporation** will feature applications and advantages of high-temperature liquid heat-transfer systems in industrial processing. A new family of heat-transfer media, the aryl silicate group, will be commercially introduced. These fluids operate in pressureless systems and are good for temperatures ranging from -100 to 650°F.

The **Carbone Corporation** will show a 24" Polybloc graphite heat exchanger.

The **Chemical and Industrial Corporation** plans to feature their new phosphoric acid plant on which they have recently obtained licensing rights. Plant uses the Prayon process.

**Nichols Engineering & Research Corporation** will demonstrate their newly developed powder atomizer. Unit is capable of atomizing filter cakes or centrifuge sludges without necessity of reslurrying in water. Another apparatus that is sure to catch your eye is the Erweka all-purpose processing machine to be featured by **Chemical and Pharmaceutical Industrial Co., Inc.** Unit consists of a basic motor drive to which 14 accessory units (agitator, mixer, grinder, coater, etc.) and instruments may be attached and used with single motor.

For those interested in tab-

let presses, **Arthur Colton Company** will show their newest machine for the first time. Machine is said to be the fastest producer of dry coated core tablets.

The **California Pellet Mill Company** will be making its first public introduction of a new series of pellet mills. Equipment features dust-tight construction and flexibility of feeder or mixer-feeder requirements.

## Chemical Materials

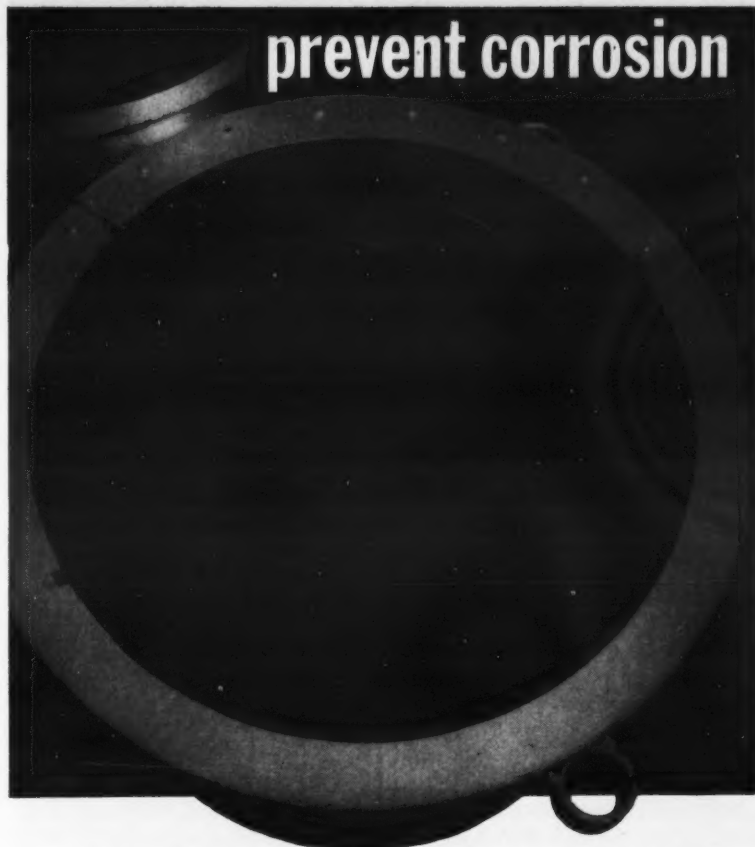
A number of new chemical materials will be spotlighted. The **Quaker Oats Company** offers three brand-new products in developmental quantities: methylfuran, methyl-tetrahydrofuran, and gamma-valerolactone.

**Victor Chemical Works** will highlight eight newcomers to their line of chemicals. Di-allyl chloromethylphosphonate makes polymers and copolymers that are suitable for laminating and casting, and have excellent optical properties, solvent resistance, hardness, and flame resistance. Di-butyl chloromethylphosphonate is a plasticizer which imparts flame resistance to vinyl and cellulose acetate plastics and polyesters resins.

Di(2-ethylhexyl) chloromethylphosphonate imparts exceptional low-temp flex to vinyl films. Di-phenol phosphite is an intermediate for organophosphorus compounds. It is a phosphorylation agent and light stabilizer. Phosphorus heptasulfide is a lube additive and intermediate for organic chemical reactions. VFP-56 is a clear liquid for use in flame-proofing textiles and paper. It also increases wet-strength of paper.

All the above will be available in research through pilot-scale quantities. Offered in commercial quantities will be o,o-dimethyl phosphorochlorodithionate, an intermediate for insecticides, oil additives, plasticizers, and flame retardants; and superphosphoric acid, a mixture of ortho, pyro, and tripolyphosphoric acids, for use in making fertilizers and in

## prevent corrosion



... with **KEL-F LAMINATE** linings



From a reactor pot to a tank truck—**KEL-F** Laminate linings offer the way to make any ordinary equipment and piping extremely resistant to acids, alkalies, oxidants and solvents at temperatures up to 350°F—and at reasonable cost.

**KEL-F Laminate**, Garlock style No. 9574, is a durable, shatterproof, abrasion resistant, chemically inert fluorocarbon plastic, bonded to a glass-cloth backing for maximum adhesion. It is readily cemented over any contour and to any material of construction—metal, wood, concrete, etc. **KEL-F** being a thermoplastic resin, seams may be "welded", on the job by the thermal pulse technique, into a continuous chemically-impregnable lining.

**CERTIFIED APPLICATORS**—**KEL-F** Laminates are manufactured by the United States Gasket Company, pioneers and leaders in fluorocarbon plastics, and are available for installation by certified applicators.

Write for Bulletin AD-152.

**UNITED STATES GASKET COMPANY**  
Camden 1, New Jersey

\*Min. Mining & Mfg. Co. Trademark

**United States Gasket** *Plastics Division*

OF THE GARLOCK PACKING COMPANY

Check 1780 opposite last page.





## Flintkote's answer to economical, long term protection of metal and masonry

**HYDRALT\*** asphalt protective coatings are clay emulsions, reinforced within the film. Won't sag under heat. Won't get brittle or crack in cold. Will outlast any other form of bituminous coating exposed to weather.

They give best protection against moisture, corrosion, smoke and fumes. One coat of Hydralt is equal in thickness to many coats of paint. Stands up for years at lowest annual cost.

To restore old or leaky masonry buildings, protect with Hydralt. Give steel lasting protection with Hydralt. It is black, but if your finishing problem requires color a companion product...Decoralt... is now available.

**DECORALT†**, a pigmented flexible latex base dispersion is designed to coat asphaltic materials and asphalt protected surfaces *in color*... red, green, white, cement gray, or variations.

It is weather resistant, opaque, full bodied... fortified with asbestos and minerals. Decoralt imparts desirable decorative finish over asphalt...wear resistant, too, over pavements.

Decoralt also seal coats masonry as a direct application for weather resistant, decorative finishing more durable than paints. Use it over concrete, cinder block, brick or stucco.

\*Reg. U. S. Pat. Off.

†A Trademark of The Flintkote Company

Get full information about Flintkote's effective waterproofing, corrosion proofing three coat system with color finish. Technical data sheets for these products are yours for the asking.

The Flintkote Company, Industrial Products Division, 30 Rockefeller Plaza  
New York 20, N. Y.

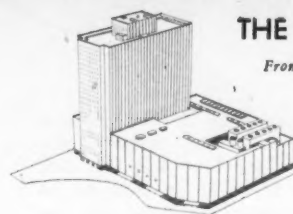
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In Toronto, Ontario: The Flintkote Company of Canada, Ltd.  
In London, England: Industrial Asphalts Company, Ltd.



# FLINTKOTE

Check 1781 opposite last page.



## THE 1957 CHEM SHOW

*From preceding page*

metal treating.

The Luzerne Rubber Company is exhibiting hard-rubber heat-resistant compounds. Two of these are based on buna-N rubber. One, called C-66, is a general-purpose compound with an ASTM heat-distortion point of 264°F.

Latest information on Synthamica, synthetic mica, will be available in Synthetic Mica Corporation's exhibit. Put on your thinking caps because they're offering prizes for suggestions of new uses of synthetic mica in industry.

## Corrosion Control

The Titanium Alloy Mfg. Div., National Lead Company, will display two new products — titanium (98%) briquettes and a 50% zirconium-magnesium master alloy. General Plastics will reveal how Teflon, Kel-F, and nylon can be used to advantage for furnishing corrosion-resistant linings to processing equipment. Preparations are being made by duVerre, Inc., for introduction of a line of standard rectangular glass-fiber-reinforced plastic tanks. Heil Process Equipment will show two new, all-plastic ventilating fans in large capacities — and a solid plastic fume scrubber which can be obtained up to nine-feet in diameter. Portable corrosion-resistant storage tanks for handling chemicals will also be on exhibit. A plastic pump and motor unit for handling corrosive ferric chloride will be featured at the Jabsco Pump Company booth. Komline-Sanderson Engineering Corp. will show a new acid pump, featuring double check-valve for compactness and accuracy. Company will also introduce a 2" dual-valve diaphragm slurry pump.

Another pump, a Moyno with a full-molded stator —

which will handle caustic satisfactorily — will be shown by Robbins & Myers.

The U.S. Stoneware Co. will introduce two three-part corrosion-resistant painting systems. One is based on vinyl derivatives, builds up dried-film thickness of five to six mils. Second is epoxy-based. Also will exhibit twin tubing having outer flexible Tygon jacket and simultaneously extruded inner core of a new polymer with greater resistance to fluorocarbons. Will also show twin tube of rigid and flexible Tygon for added strength and heat resistance.

## Safety

The W. N. Gates Company will exhibit a free-hanging bull plug — with brilliant red bands — which will pinpoint dangerous openings in pipe lines.

## For the Laboratory

Bethlehem Apparatus Company will exhibit many sizes — both rectangular and round — of surface-mixing gas-oxy burners. A single stopper, either rubber or neoprene, that takes the place of 17 single rubber stoppers is also to be shown.

For on-the-spot control work, or wherever it is advantageous to have lab facilities for testing or checking samples, Kewaunee Manufacturing Company has a portable laboratory table furnished with its own water supply and waste facilities.

New developments to be demonstrated by Brinkmann Instruments, Inc., include high-accuracy combination waterbaths and circulators, contact thermometers and matching relays, several multi-channel recorders, and fully automatic viscosimeters.

Aetna Scientific Company is exhibiting a high-speed compact sterilizer suitable for laboratory work. It is small, yet holds three trays and attains sterilizing temperatures rapidly. Selective temperature-pressure switch for sterilizers is also shown.



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Interested in fractionating distillation apparatus? *Stanford Glassblowing Laboratories* is showing a unitized spinning-band column which has only a two- to three-ml holdup, thirty theoretical plates, and 60% efficiency at a liquid take-off of 43 ml per hour.

An "Automatic Chemist" which does the work of three chemists is to be demonstrated by the *Fielden Instrument Division of Robertshaw-Fulton Controls Company*. Erlenmeyer and filtering flasks of high-temperature polyethylene are being introduced by *Bel-Art Products*.

## Analyzers

For those interested in determining ash and sulfur in coal and coke, *Laboratory Equipment Corp.* is demonstrating a high-temperature method using a high-frequency furnace which requires only 10-15 minutes for coal ashing. Analysis of % sulfur in coal can be made in six minutes.

Eliminating many pre-analysis separations and simplifying determinations of metals in solution, *Fisher Scientific's* electro-analyzer makes successive determinations of several metals within a single sample. Other equipment to be shown includes gas-liquid partition chromatography analyzer and "unitized" steel furniture units for laboratories.

*Applied Research Laboratories* is demonstrating an X-ray fluorescent analyzer for spectrochemical process control. A wide field of application possibilities embraces metals, ores, slags, cements, pigments, catalysts.

*Scientific Glass Apparatus Company, Inc.*, has ready, glassware of the latest design. Included is a glass melting-point apparatus for determining melting point of organic compounds. *Anschutz-type* thermometer for taking temperatures at different immersion depths with only one thermometer will also be on display.

Constant air flow is available in fume hood to be shown by *Duralab Equipment*

*Corp.* Unit permits fume hood to function as part of air-conditioning system.

For continuous agitation of solution in Erlenmeyers or other glassware, *New Brunswick Scientific Co.* will exhibit a three-eccentric-shaft shaker. Unit distributes positive rotary motion to all parts of shaking platform without swaying or sagging at extremes of table. Compact incubator-shaker which maintains temperature from ambient to  $60^{\circ}\text{C} \pm \frac{1}{2}^{\circ}\text{C}$  will also be included in display.

Applications of electromagnetic support principles are to be exhibited by *Virginia Research Associates, Inc.* Ultracentrifuges suitable for molecular-weight determination by equilibrium methods will be demonstrated, plus an electromagnetic balance for a mass-measuring device. Quantitative measurement techniques for direct measurement of film adhesion are to be shown. Also, company will demonstrate an analog computer for controlling chemical processes.

*Heinicke Instruments* will show a laboratory glassware washer employing ultrasonics as an accessory for pretreatment in removal of baked-on soil. *Namco Machinery, Inc.*, will also display an improved laboratory glassware washing machine.

## Instrumentation and Control

A new instrument is to be shown for the first time by the *Jacoby-Tarbox Corporation*. It is an industry turbidity indicator to continuously monitor and control turbidity in liquids. Instrument can be installed directly in filtrate pipelines to control filtration processes.

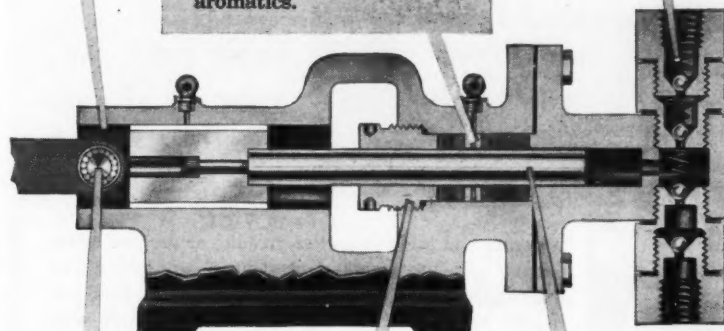
*Brooks Rotameter Company* will introduce a low-cost rotameter with 150-mm scale length for greater readability. *Photovolt Corporation* is exhibiting line-operated electronic pH meter which features compactness and low price. Also, company is displaying a variable-response

# PICK THIS PUMP for reliability and maintenance economy...

**CROSS HEAD** is oversized, running in carefully machined guide—preventing usual pump failures at this point. All moving parts and packing can be removed without breaking piping connections.

**LIQUID ENDS:** Valves are machined from solid stainless steel. No pressed seats to work loose. Valve balls are hardened and ground, and stainless steel spring-loading insures instant response, even on viscous liquids and slurries.

**LANTERN RING** readily changed from grease to water or oil seal for handling crystallizing liquids, slurries, corrosives, volatile toxics, aromatics.



**CONNECTING ROD BEARINGS**—hardened and ground pins running in grease lubricated needle bearings, replace the usual rapidly-wearing bronze bushings.

**PISTONS** are stainless steel, ground and polished. Accurate capacity control is obtained by piston stroke length adjustment. Adaptable to both manual control and instrumentation.

**PACKING GLANDS** are easily accessible at both ends to simplify packing replacement. Gland take-up is a screwed nut, insuring even pressure on packing—no cocking, less packing trouble.

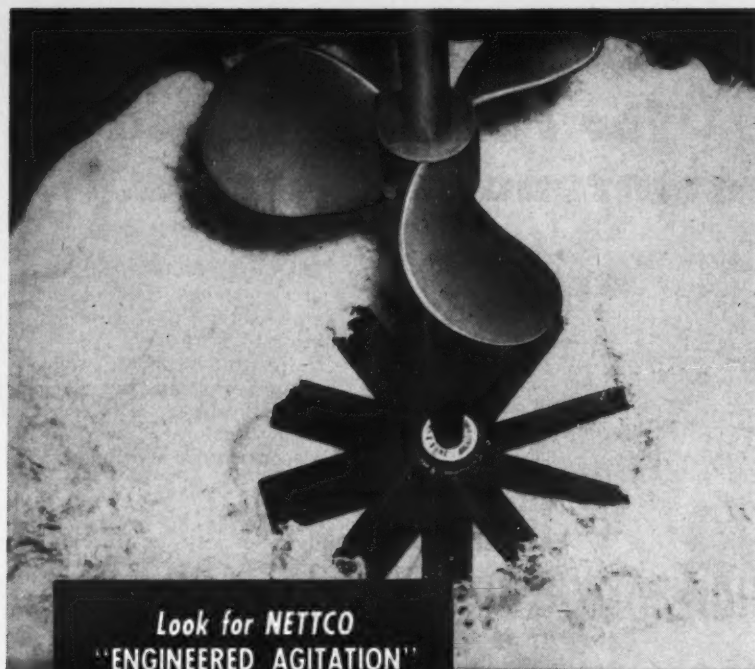
For more facts about Philadelphia type S Pumps—for 85% of all chemical pumping needs—write for Bulletin S-1254.

**PHILADELPHIA PUMP DIVISION  
OF AMERICAN METER COMPANY**  
13500 Philmont Ave., Phila. 16, Pa.

# PHILADELPHIA PUMP

DIVISION OF AMERICAN METER COMPANY | EST. 1836

Check 1782 opposite last page.



Look for **NETTCO**  
"ENGINEERED AGITATION"  
in BOOTH No. 79  
CHEMICAL SHOW

December 2-6, 1957  
Coliseum • New York, N. Y.

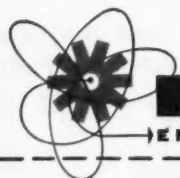


Whether you use a propeller, paddle, or turbine mixer to meet your process demands depends upon how well the fundamentals of agitation are applied to your particular problem. These agitation fundamentals were also basic in developing the most complete, best engineered agitator line available . . . that offered by **NETTCO**! Stop at our booth at the Chemical Show and see what **ENGINEERED AGITATION** can mean to you . . . dollar-wise, performance-wise, and **NETTCO**-wise!

**Backed by over 50 years of experience...**

- TANK TOP AGITATORS
- PORTABLE & TRIPOD MIXERS
- SIDE DRIVE AGITATORS
- PIPELINE MIXERS-FLOMIX®
- AGITATOR FITTINGS

If you are unable to attend the show, send your process specifications directly to **NETTCO** agitation engineers for recommendations. Request free literature on any or all of the agitators listed above. Address requests to New England Tank & Tower Co., 93 Tileston Street, Everett 49, Massachusetts.



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ENGINEERED AGITATION

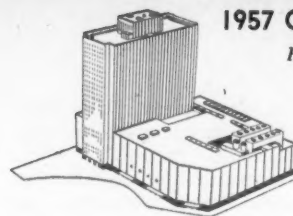
**FREE LITERATURE**

Please send me the following literature:

- ☐ Tank Top Agitators—Bulletin 551 ☐ Pipeline-Flomix®—Bulletin 531  
☐ Portable & Tripod Mixers—Spec. Sheets ☐ Side Entering—Bulletin 532



Check 1783 opposite last page.



## 1957 CHEM SHOW

From preceding page

recorder for evaluating electrophoretic patterns on filter paper. The **Norcross Corporation** will spotlight a pipeline viscometer.

**Burling Instrument Company** is showing a Couple-Switch assembly. Unit provides safety alarm and cut-off without need of a separate installation.

**Bailey Meter Company** is exhibiting a performance monitor for computing and recording efficiency of a process. Results are expressed in percent efficiency and dollars-cost-per-unit. Unit continuously solves process equations on an analog basis.

**Perkin-Elmer's** new process vapor fractometer for continuous analysis of gas streams is being shown. P-E is also highlighting a triple-stage laboratory vapor analyzer.

Needed to convert strip-chart recorders for chromatography work, **Brown Instruments'** new continuous integrator is being displayed. It integrates a linear output signal directly and gives quantitative reading. **Minneapolis-Honeywell Regulator Company** is displaying a flowmeter and digital potentiometer.

Is moisture recording a problem? **Brabender Corporation** is introducing a continuous fully automatic moisture recorder which samples process stream once every twelve minutes, day and night.

**Fischer & Porter** plans to introduce an obstructionless magnetic flowmeter, and an industrial data logger and alarm scanner. Redesigned products are a differential pressure transmitter and improved pneumatic controller.

An improved version of **Precision Chemical Pump Corporation's** positive-displacement pump will be shown. It's designed for feeding chemical solutions accurately, including the halogen acids.

**Norman Bragar Company, Inc.**, is displaying **Scam Instrument Corporation's** newly designed annunciator alarm system. A transistorized potentiometer strip-chart by **West Instrument Corporation** will also be shown in this booth.

Automatically closing on failure of control or instrument air, valve shown by **Research Controls** has a built-in precisor mounted on the top. Also, a micrometer-adjustable manual needle valve will be exhibited.

**Milton Roy Company** will show controlled-volume diaphragm pumps which will accurately meter liquids against pressures to 2000 psi and at rates to 400 gph. Pumps are suitable for metering toxic or obnoxious chemicals where even slightest leakage cannot be tolerated. New product is a four-way valve for company's  $\Delta P$  pump.

**Gow-Mac Instrument Company** is showing a thermal conductivity gas analyzer and recorder-controller with low noise level.

**McIntosh Equipment Corporation** is displaying products of eleven manufacturers. Several new products are being shown. One is a **Gems** differential pressure switch to indicate when filters are clogged. Another is a **Bart** "off-the-shelf" stainless steel centrifugal pump. A **Falcon** self-contained non-electric non-pneumatic overflow alarm is displayed. Others are a **Flow-Actuated** control for starting and stopping up to eight pumps according to flow demand, and a **Jarco** capacitance-type level indicator.

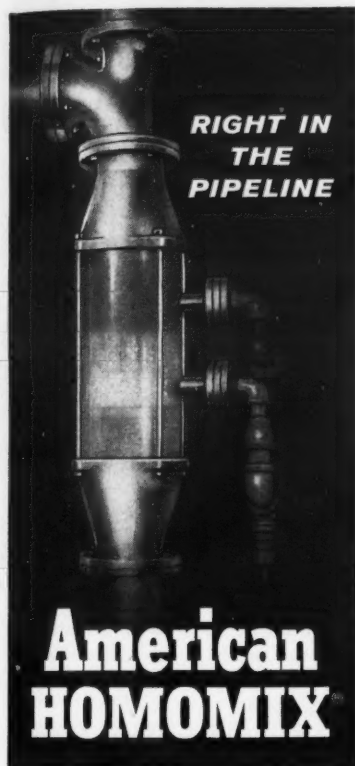
## Material Handling

Material handling exhibits are going to be quite active to give the viewer some working ideas of new concepts in such equipment. Many manufacturers will have actual equipment or models of their units in operation at the show.

A completely integrated system composed of standard units and machines will be in operation at the **Sprout**,



# CONTINUOUS LIQUID, GAS OR SLURRY CHEMICAL MIXING



**RIGHT IN  
THE  
PIPELINE**

**American  
HOMOMIX**

**Gives instant, uniform,  
complete mixing  
without a mixing tank**

Saves space, time and equipment. Simplifies and speeds the blending of one or more chemicals. Permits a wide range in the percentage of additives to base fluid and assures accurate, economical mixing control. Any number of diffusing stages can be selected. Provides for visual inspection of the mixing operation and access to diffusing impeller. Can be equipped with lift stage. Can be made of standard or special material and protectively coated. Easily installed in vertical, horizontal or inclined position. Wide range of sizes and capacities from 1 GPM to 15,000 GPM.

Send for Technical Supplement HM or for details on your application.

(Patented)



IN OUR 89TH YEAR

**AMERICAN WELL WORKS**

Mixing, Pumping, Water & Waste Treatment Equipment

150 N. BROADWAY, AURORA, ILLINOIS  
Sales Offices: Chicago, New York, and other principal cities

Waldron & Co., Inc., booth. The combined positive-negative pressure handling system will convey materials into a mixer, mix them, and drop them into a standard Gyro-Shaker, and then distribute them back into two glass containers.

Tote System, Inc. will have a new stationary hopper, tilt-mounted on scaling equipment, for automatic batch weighing and/or blending. On display for the first time will be the new liquid portable Tote Tank.

## Conveyors

A small-scale working model of Fuller Co.'s "Horizontal Airslide" will be in operation. This is a modification of their Airslide fluidizing gravity conveyor, coupled with a vertical fluid lift to accomplish function of horizontal conveying.

Also, Fuller Co. and Carrier Conveyor Corp. have worked together to develop the Natural Frequency Airslide. This machine, a combination of the well-known Fuller Airslide and a Natural Frequency Vibrating Conveyor, will be on display in the Carrier Conveyor booth.

A sanitary elevator conveyor will be introduced by Bucket Elevator Co. This bulk material-handling unit is fabricated for easy disassembly and cleaning.

A lightweight, aluminum, air-operated vibrator features permanent lubrication with molybdenum disulfide dry-film lubricant. Unit will be found in the Cleveland Vibrator Co.'s booth.

## Trucks and Tractors

The show will be the first time that Allis-Chalmers will display its new 10,000-lb lift truck. Unit has been designed to handle heavy-duty jobs while maintaining safety and operational features of lighter models.

Industrial tractors requiring no operators will be on the move around the Barrett-Cravens booth. Both radio-

► Dryers ► Coolers ► Ammoniators\*  
► Granulators\*  
► Elevators  
► Conveyors

\*IWA Licensed Manufacturer

**FOR THE  
CHEMICAL  
INDUSTRY**

Serving the process industries for over 80 years, Edw. Renneburg & Sons Co. has been designing and manufacturing special machinery for chemical producers since before the turn of the century.

Edw. Renneburg & Sons Co. maintains a staff of trained, experienced engineers... an alert group which is constantly seeking better chemical processing methods, as well as simplifications and improvements in the present Renneburg line.

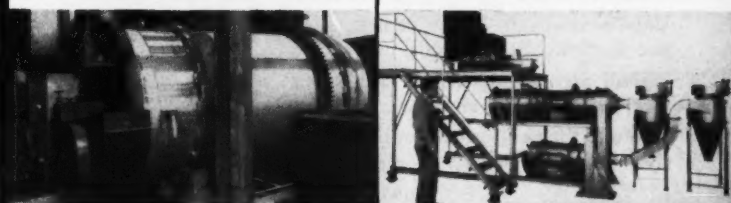
**BE SURE TO  
VISIT**



Renneburg DehydrO-Mat Dryer

Renneburg DehydrO-Mat Cooler

**RENNEBURG  
BOOTH No. 1078**



Renneburg Ammoniator-Granulator

Renneburg Pilot Plants

**at the  
CHEM SHOW  
DECEMBER 2-6**

Literature and information on request

**Edw. Renneburg & Sons Co.**

2639 BOSTON STREET, BALTIMORE 24, MD.

Check 1784 opposite last page.

NOVEMBER 1957

Check 1785 opposite last page.



# FLETCHER **TORNADO**

## THE CENTRIFUGAL WITH FULL AUTOMATION

Bottom  
Discharge  
Tri-Point  
Centrifugal



**CUT PRODUCTION COSTS IN HALF** — The Fletcher Tornado needs no operators. It's fully automatic, gives you 24-hour production. You're certain of quality control of your product because of the uniform load and the unvarying consistency. Compare these features.

**Uni-Construction**—Entire centrifugal—basket, curb, drive and accessories oscillate as a unit.

**Bi-Ball Swivel** — Dual ball and socket on each of the three steel balancing stands assure smooth oscillation.

**Tri-Point Suspension**—Scientifically positioned to provide positive, effortless balance of the entire centrifugal.

*Also available in manual and semi-automatic models.*

*F/M variable drive • Zero to maximum RPM*

**The New Fletcher Works, Inc.** CENTRIFUGAL DIVISION

2nd & Glenwood Avenue • Philadelphia 40, Pa.

Send me additional information on the Fletcher Tornado Centrifugal

NAME & TITLE

COMPANY

ADDRESS

CITY & STATE

C-1

Check 1786 opposite last page.

## 1957 CHEM SHOW

*From preceding page*

wave and light controlled units are available.

Clark Equipment Co. will be showing its 16-cu-ft tractor shovel. This highly maneuverable machine is reported to be able to move easily in and out of box cars, wriggle down narrow aisles, or scurry through crowded yards.

On display and in operation will be a new bag-packing system manufactured by Bemis Bros. Bag Co. System contains a unit to weigh and fill bags rapidly, while other components convey and completely seal the top closure with new pressure-sticking Bemis-tape. Booth will also present "what's new" in bags of all styles, threads, waterproof bags, Tekmold protective packaging, and Transwall industrial folding doors.

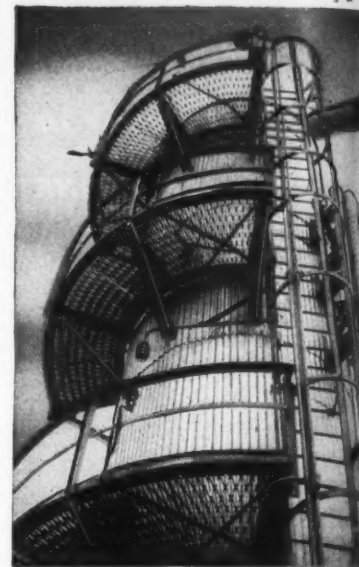
For versatile product handling, The Exact Weight Scale Co. offers three pieces of weighing equipment. Automatic check-weighing machine provides accuracies in range of one part in 5000 up to one part in 20,000. Heavy-duty case and bag checkweigher can handle products up to 36" in length at speeds up to 25 per minute. Basic weight classifier is for classifying and process control of products and packages by weight. Shadograph scale and photocells provide variety of process controls.

On display will be Sterling, Fleishman Co.'s hydraulic drum lift for controlled pouring. Unit was developed to meet the demand for a machine to give controlled pouring of heavy, viscous materials from drums and containers into mixing tanks and vats.

## Plant Engineering and Maintenance

Of particular interest to those responsible for plant engineering and maintenance, will be a gasketing material developed by Metal Textile Corp. to reduce excessive leakage across fractionating trays in columns. High corrosion and temperature resistance is achieved by using a protective sheath of knitted

**RAIN OR SNOW  
CAN MAKE  
CATWALKS  
DANGEROUS**



Walkways, catwalks and treads made of solid wood, metal or other material can collect snow, rainfall, grease or oil and become dangerously slippery.

But these walking surfaces, made of an open mesh of metal bars on edge, cannot collect these substances, leaving the surface always clean, dry and tractional for safer access to high places.

As founders of the grating industry, the Irving Company can draw upon over half a century of experience to supply you with quality grating products for catwalks, treads and other practical and economical uses.

**"A FITTING GRATING  
FOR EVERY PURPOSE"**

Write for our  
General Grating Catalog.

**IRVICO**

**IRVING SUBWAY GRATING CO., Inc.**  
Originators of the Grating Industry

Offices and Plants at  
5050 27th St., LONG ISLAND CITY 1, N. Y.  
1850 10th St., OAKLAND 23, CALIFORNIA

Check 1787 opposite last page.

CHEMICAL PROCESSING

Monel wire on asbestos.

For process heating, *Parks-Cramer Co.* offers a packaged heating system requiring only to be connected to vessels or equipment for fully automatic electric heating. Jacketed angle, plug, Y, and swing-check valves and a jacketed line strainer will augment system.

## Valves

A valve development comes from *Continental Manufacturing Co.*: a bottom-entry, three-plug valve of stainless steel. Teflon sleeve eliminates lubrication.

*Velan Steam Specialties, Inc.*, will show a valve with universal body design for globe, stop, check, needle, and flow control units.

Remote control operation of PVC valves up to three inches is possible with devices exhibited by *Jamesburg Corp.*

Another jacketed plug valve will be shown by *Industrial Div., of Hetherington & Berner Inc.* This is a spring-loaded unit which gives a tight seal, is easy to clean.

For automatic valve operation *The Okadee Co.* will introduce units equipped with electro-hydraulic operators. System was developed to provide same features of operation and control as obtainable from a motor drive, with considerable saving in space.

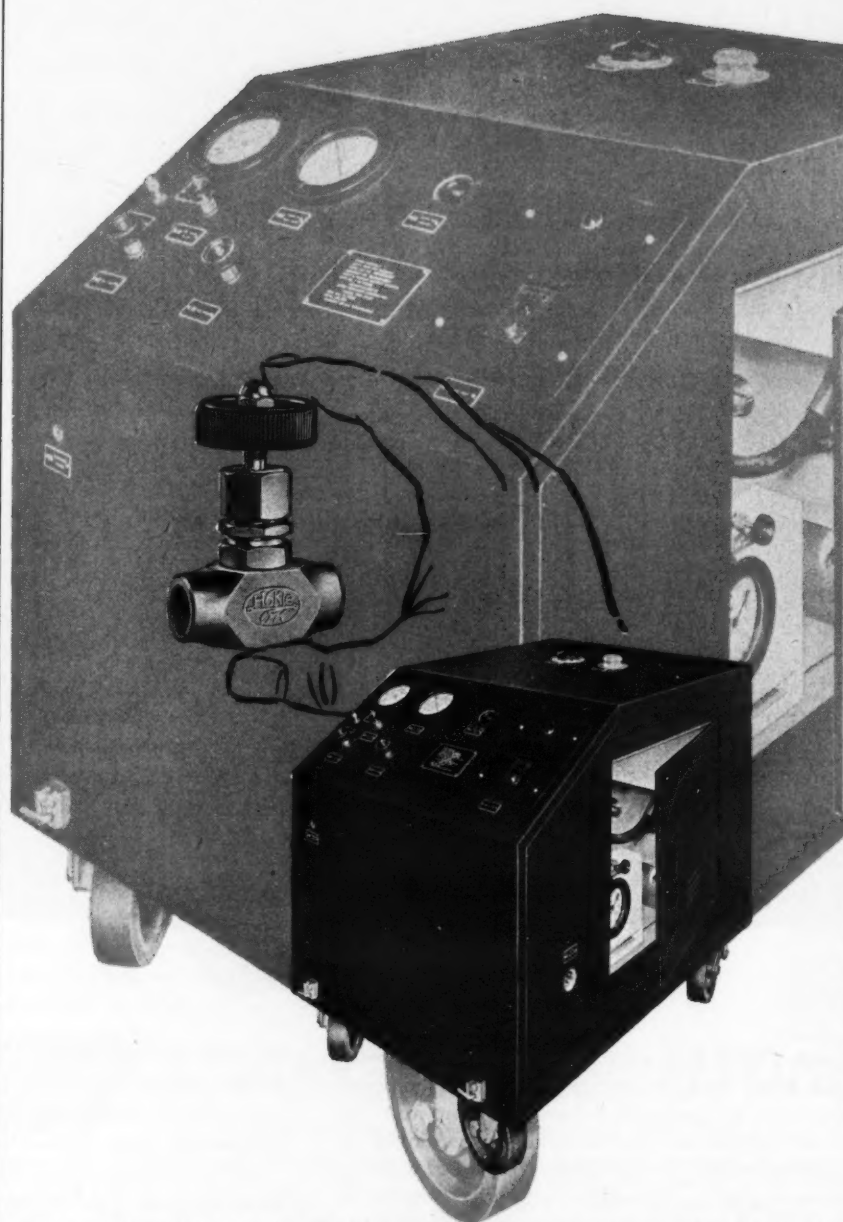
If stuffing-box lubrication is a problem you'll want to see the compact, automatic system for circulating lubricating oil exhibited by *Durametallic Corp.* System is either motor- or turbine-driven and provides a uniform pressure greater than fluid pressure within pump or vessel.

## Pumps

On the subject of pumps, *Manton-Gaulin Manufacturing Co., Inc.*, plans to introduce a rotor-arm pump for handling corrosive and abrasive slurries and semi-solids.

*Aurora Pump Div. of The New York Air Brake Co.* will show two types of process pump; one for temperatures up to 450°F, foot-mounted; the other up to 800°F, centerline-mounted. Units can use either mechanical seals or packing. *Falls Industries, Inc.* will show a close-coupled centrifugal

To page 64



HOKE, INCORPORATED, FLUID CONTROL SPECIALISTS, 145 S. DEAN ST., ENGLEWOOD, N. J.

## small valves are judged by the company they keep

Anyone who has had experience with jet fuel will tell you how difficult it is to seal in. Like alcohol in your car radiator, it'll find a way out where water won't—and a favorite spot is the valve packing. Most valves shy away from "keeping company" with jet fuel . . . but not Hoke's 270 Series needle valve with O-ring stem seal. Flight Support Incorporated of Linden, N. J., uses five of them to handle the elusive material as it passes through their Model TE-7001 Portable Static Fluid Test Machine. The equipment checks fuel system components on turbo-jet engines.

Thanks to the resiliency of the O-ring and the accuracy of the machined bonnet into which it fits, Flight Support found the 270 Series to be best for their use . . . not a pound of pressure nor an ounce of fluid gets by!

Checking out jet engines is pretty fast company for small valves . . . that's why producers of high quality test and production equipment have often turned to Hoke for valves that measure up to such strict dependability requirements. Users, too, recognize the craftsmanship in Hoke's valves, and look for them on the equipment they buy.

There's more to the Hoke story. In our new catalog (MV-957). It's yours for the asking.



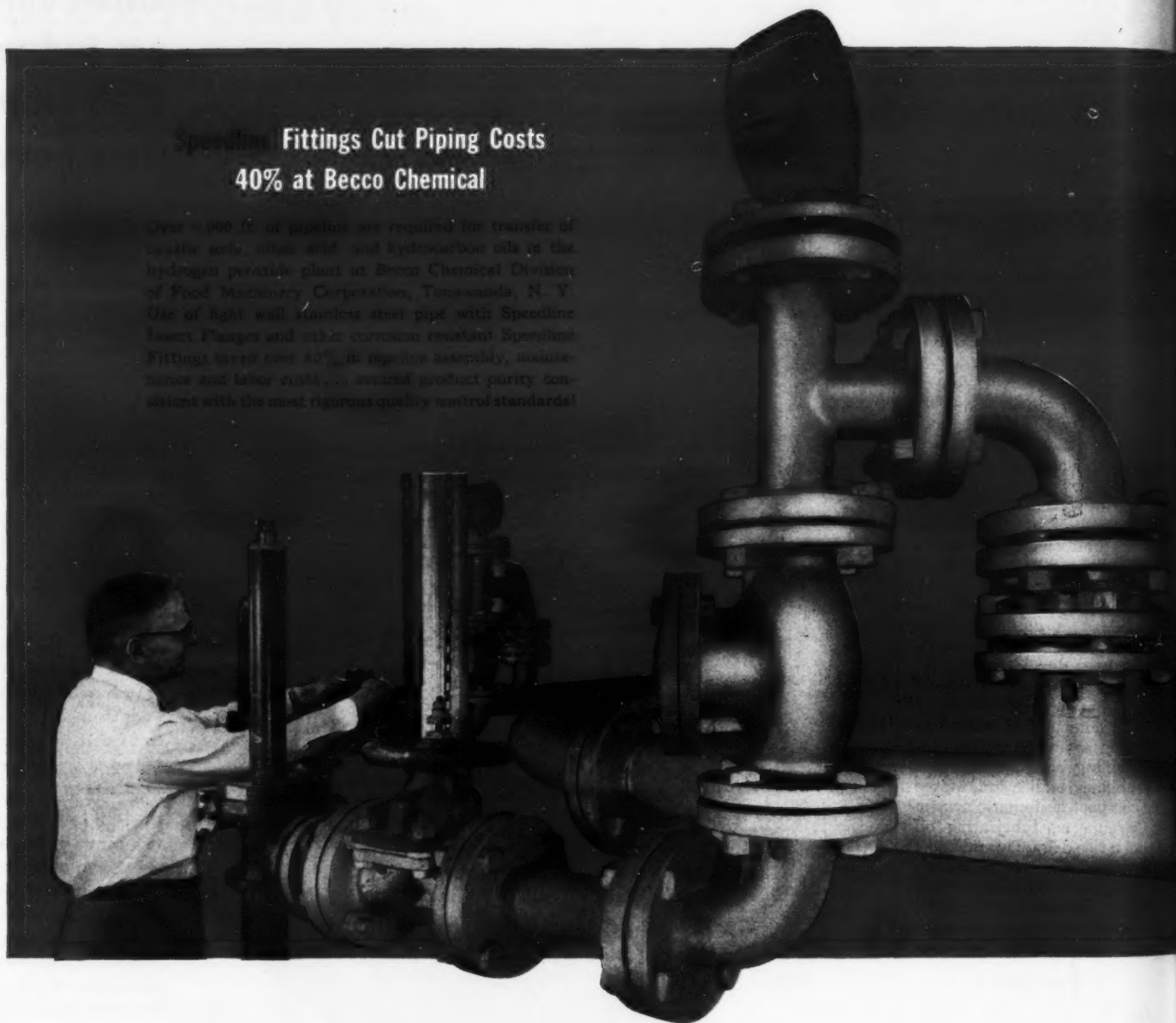
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# Speedline®

where corrosion resistant piping is required  
**PROCESS PLANTS SPECIFY SPEEDLINE FITTINGS**

## Speedline Fittings Cut Piping Costs 40% at Becco Chemical

Over 1,000 ft. of pipeline are required for transfer of caustic soda, nitric acid and hydrocarbon oils in the hydrogen peroxide plant at Becco Chemical Division of Food Machinery Corporation, Tomsawanda, N. Y. Use of light wall stainless steel pipe with Speedline Insert Flanges and other corrosion resistant Speedline Fittings saved over 40% in pipe cost, assembly, maintenance and labor costs... assured product purity consistent with the most rigorous quality control standards!



***Leak-Proof Joints without Welding***—No residue traps form at points of juncture; process solutions are guaranteed *free* of "tramp iron" or other impurities. No threading, vanstoning or welding with a Speedline Insert Flange—a wrench and a Speedline expander assures a tight, leak-proof joint every time—without danger of contamination from welding operations.

***"Tangential Feature" Simplifies Assembly and Modification***—The extra straight section

on every end of every Speedline formed fitting permits greater clearance for easier, faster joining—with or without welding—easier disassembly of pipelines when layout changes are required.

Discover how you can reduce costs wherever corrosion resistant piping is required at your plant . . . with Speedline Fittings, designed especially for use with low cost, light wall Schedules 5 and 10 stainless steel pipe.



# Real Pipeline Economy Begins AT THE FITTINGS

Only Speedline Corrosion Resistant Fittings permit

- Multiple choice of joint with every fitting—on the job!
- Time and cost saving design and assembly for any piping installation!
- Most economical use of low cost, light wall Schedule 5 and 10 stainless pipe!



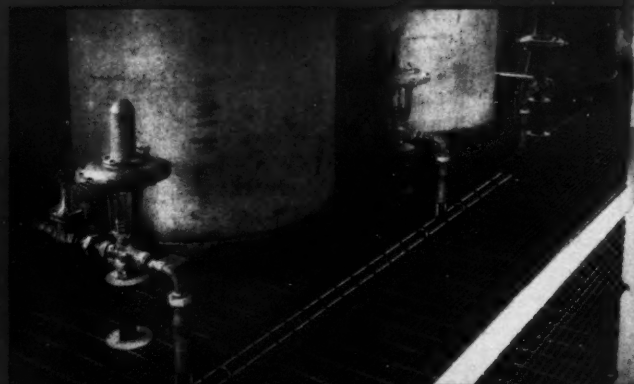
At Chapman Chemical Company—"Bestest, most economical means to assemble leak-proof, corrosion-resistant process lines", reports chief plant engineer concerning their new costs program.



At Johns-Manville Corporation—Lower material costs, ease of installation, labor savings and length of service life led to specification of light wall stainless pipe and Speedline Fittings for entire system at new "Micro-Co" Plant.



At Koppers Company—Reduction of 70% in installation time, plus substantial savings in material costs and 100% protection against leakage in polyethylene process lines reported by plant engineers after installation of Speedline Fittings.



At American Alcolac Company—Assembly advantages of Speedline unions permit easy removal of under-flow lines for cleaning or modification in highly inflammable area at Baltimore plant. Specification of Speedline Fittings for the entire piping system reduced material costs and maintained high degree of process purity.

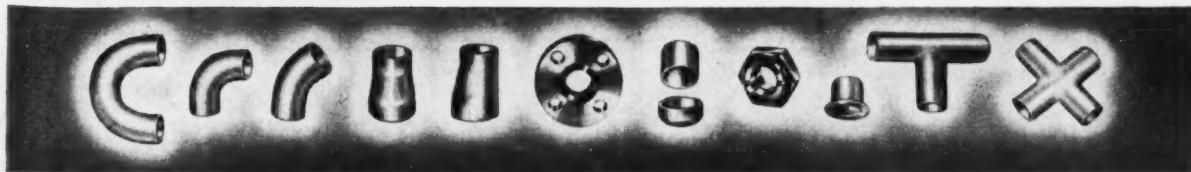
For complete details on how the complete line of Speedline Corrosion Resistant Fittings and low cost, light wall stainless pipe can cut your process piping costs . . . write for your copy of illustrated "Speedline Fittings" brochure without obligation.



**Speedline**  
SPEEDLINE IS A REG. T. M. OF HORACE T. POTTS COMPANY

## STAINLESS STEEL FITTINGS

SPEEDLINE DISTRIBUTORS ARE LOCATED IN PRINCIPAL CITIES FROM COAST TO COAST



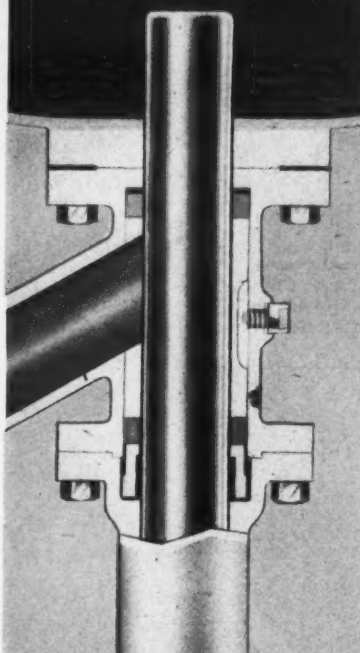
Manufactured by **HORACE T. POTTS COMPANY** • 500 E. Erie Avenue • Philadelphia 34, Penna.

For more information on product at left, specify 1789 see information request blank opposite last page.



*a*  
FLUSH BOTTOM VALVE  
*that*  
WILL NOT CLOG UP!

Designed for Chemical and  
Pharmaceutical Industries




**Strahman**  
RAM TYPE  
Drain Valves

The Strahman Drain Valve is the only valve that cannot clog up. It is so designed that in the closed position the piston or ram extends up into the tank thus preventing any possibility of the outlet becoming plugged.

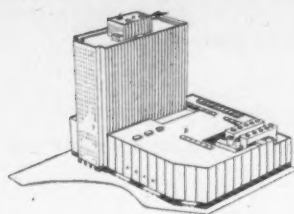
In the open position, full and unobstructed flow is assured as the piston is drawn down into the bonnet leaving a completely open passage for the material passing through.

Write direct for complete catalogue



**STRAHMAN**  
VALVES, INC.  
14 HUDSON STREET  
NEW YORK 13, U.S.A.

Check 1790 opposite last page.



## 1957 CHEM SHOW

From page 61

pump having a side suction and top discharge.

If pumping liquid oxygen at high pressures is of interest, Lawrence Pumps Inc. will exhibit a vertical five-stage unit of new design, in addition to horizontal propeller and slurry pumps. Another slurry handling unit will be exhibited by Chempump Corp. Canned pump will be shown in operation. Canned pump with capacity of 600 gpm will be shown.

To help handle low-temperature processes, an expanded polystyrene board and pipe covering will be featured by Mundet Cork Corp. This insulation is for services between  $-300^{\circ}\text{F}$  and  $+175^{\circ}\text{F}$ .

Going from cold to hot—Trent, Inc. will present a metallic, electric-resistance, heating element. Tubular unit has a porcelain filler for added strength, and lower watt density per length at equal resistances than can be achieved with wire or rod.

## Compressors

Back to cold again—on display by Frick Co. will be a compressor designed to handle either ammonia or Freon-22. Unit has nine cylinders of  $4\frac{3}{4}$ " bore by  $3\frac{3}{4}$ " stroke, and will operate up to 970 rpm.

Another compressor, for high pressures, will be exhibited by Pressure Products Industries Inc. Units will provide up to 30,000 psi, in 1, 2, 3, and 4 stages. Plant-size, high-pressure valves, up to 30,000 psi, have bore sizes in range of  $\frac{5}{8}$  to 1". Additional items will be a 60,000-psi air-driven pump with externally removable and replaceable check valve, and diaphragm catalyst pumps for pressures up to 30,000 psi.

Plating men will want to look over rhodium plating so-

lution featured in display of General Plate Division of Metals & Controls Corp. Unbreakable transparent containers can be safely handled and stored.

If you're heating with steam, see the Velan exhibit which features a monovalve float and thermostatic steam trap that permits venting of air and water, trapping of steam, discharge of steam-hot condensate, and check-valve action with one seat, valve, and mechanism.

Motors for a variety of uses will be on display at the Louis Allis Co's booth. A sewage pump unit operates close-coupled to a non-clog pump submerged in liquid to be pumped. Vertical hollow-shaft motors for shallow or deep-well pumps automatically disengage if motor is started in wrong direction.

For motor control, Allis-Chalmers Manufacturing Company will have on display a new line of 2300- to 4160-volt motor starters for full- or reduced-voltage starting, reversing or non-reversing, dynamic braking, or multi-speed control of squirrel-cage, synchronous, or wound-rotor units.

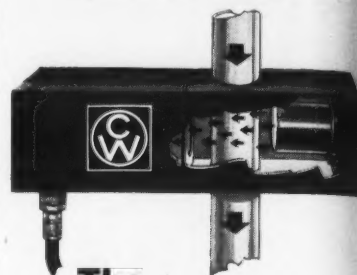
To transmit pressure from a stationary to a revolving or moving point, Sealol Corp. offers rotary and swivel joints with the emphasis on leak-free service, long life, and low turning torque.

Another development in swivel joints comes from Chiksan Co. Newly developed Discpak joint has packing seal that can be replaced without removing bearings. The Carbone Corporation will show graphite rupture discs to rupture at  $\pm 5\%$ , and graphite steam jets.

To aid in war on air pollution, U. S. Stoneware Co. has a packaged "cross-flow" fume scrubber. Unit has been field-tested and will be built in capacities ranging from 6000 to 12,000 cfm.

Another aid to pollution control is a wet scrubber on display by National Engineering Co. Continuous backwashing of filter bed assures continuing efficiency over a wide range of dust loadings.

## for CONTINUOUS PROCESS DENSITY MEASUREMENT



## The Curtiss-Wright Non-Contact DENSITY GAUGE

To measure the density of moving liquids, gases, slurries and powders in pipes or tubes or on conveyors, Curtiss-Wright DG3 Density Gauge utilizes controlled nuclear rays to provide accuracies of better than  $\pm 1\%$  in density measurement.

The small, compact measuring head is designed to fit various pipe sizes; it can be mounted on the line while remaining circuitry can be remotely placed at regular plant control stations. Highly stable, the measuring system employs direct AC amplification and will measure with a resolution of  $\frac{1}{4}\%$  over a range of 0.5-1.5 gm/cm<sup>3</sup>.

The DG3 system features standard interchangeable component drawers for easy, economical maintenance. Choice of dial indication or standard strip chart recorder presentations. The system may be combined with the Curtiss-Wright Proportional Automatic Controller to automatically adjust mixture ratios.

Complete information on the Curtiss-Wright Density Gauge available on request.

INDUSTRIAL CONTROL SALES



Check 1791 opposite last page.

CHEMICAL PROCESSING

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Trends in the chemical world . . . what they mean to you  
as reported by the editors of CHEMICAL PROCESSING

# chemical business

FOR THE MANAGEMENT TEAM

NOVEMBER 1957



as the Seaway nears completion...

**A look at St. Lawrence Shipping Costs**





# HARSHAW

Production-Controlled High-Quality

# FLUORIDES

*Boron Trifluoride*  
*Hydrofluoric Acid*  
 ANHYDROUS . . . AQUEOUS

The uses for Fluorides are ever increasing. Harshaw Fluoride production also has increased steadily. Shipments of cylinders and tank cars leave our plant daily. If required, you are invited to draw on the knowledge and experience of our staff of technical specialists on Fluorides.

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 Anhydrous and Aqueous

### Here is a helpful list of HARSHAW production-controlled high-quality fluorides:

Ammonium Bifluoride	Fluoboric Acid	Potassium Chromium Fluoride
Ammonium Fluoborate	Fluorine Cells	Potassium Fluoborate
Antimony Trifluoride Sublimed	Fluorinating Agents	Potassium Fluoride
Barium Fluoride	Frosting Mixtures	Potassium Titanium Fluoride
Bismuth Fluoride	Hydrofluoric Acid Anhydrous	Silico Fluorides
Boron Trifluoride	Hydrofluoric Acid Aqueous	Sodium Fluoborate
Boron Trifluoride Complexes	Hydrofluosilicic Acid	Tin Fluoborate
Chromium Fluoride	Lead Fluoborate	Zinc Fluoborate
Copper Fluoborate	Metallic Fluoborates	Zinc Fluoride
	Potassium Bifluoride	



Check 1792 opposite last page.

NOVEMBER 1957

Vol. V No. 11

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## Highlights

**CMRA meeting** offers hints of costs and problems of shipping via the St. Lawrence Seaway. Conclusion of meeting: No sweeping short-term effects but vast long-term advantages

page 67

**Olin Mathieson** v-p John Logan predicts 1958 chemical sales to increase five percent over 1957; sees more price hikes coming

page 69

**Five more** US chemical producers get into the high-energy fuel picture; Metal Hydrides opens "zip" fuel-components unit

page 70

**GE plans** increased output of polycarbonate resins; will make samples of new thermoplastic available to molders

page 72

**Market analyst** William R.



White of Hornblower and Weeks again looks at chemical companies. This month:

Mallory-Sharon Metals

page 74

## chemical business



The long and short of it: Upper lakes grain carrier shown tied up at right can handle a 650,000 bushel cargo,

enough to fill the six smaller canal vessels. Completed facilities of the St. Lawrence Seaway will accept carriers

730 feet long with a 75 foot beam; current locks can only accommodate ships 250 feet long with a 43 foot beam

Although such factors as length of the closed season, cooperation of the railroads and inland ports, and acceptance by the industry will have great influence on the amount of chemicals moved on the soon-to-be-completed St. Lawrence Seaway, the most important single factor will be cost. Here are some new indications of . . .

## Shipping Costs Via The St. Lawrence

Sometime early in 1959 the first ships will pass through the completed facilities of the St. Lawrence Seaway. Undoubtedly some of these ships will be carrying chemical products — both outbound to the ports of Europe and the US East Coast, and inbound to the ports on the Great Lakes. But how much chemical shipping the Seaway will carry is still a matter of some conjecture, although some pretty reasonable conclusions can be drawn now.

Out of the recent Chemical Market Research Association meeting on the Seaway came a realistic, if still hazy, picture of the waterway's effect on the industry. The conclusion reached was this: The project will have only a minor immediate effect on the chemical industry. There probably won't be any surge of chemical imports as a result of the Seaway and, except in specific cases, it probably won't effect any sweeping changes on US or Canadian exports.

But of the long-term advantages, Canadian Industries' **Douglas Walkington** says: "Predictions are being made freely that with more power plants, better harbors, and direct contact with the ports of the world, industry in general will grow substantially on both the Canadian and the US sides of the Great Lakes. Industrial growth inevitably means bigger demand for chemicals. This will lead to new or enlarged chemical plants in the area."

As far as the chemical industry is concerned, the biggest unanswered question today is still that of shipping costs. Rates are still up for grabs and the question of tolls has become a considerable political issue in the US. But Dow's **H. G. Miller** makes some predictions:

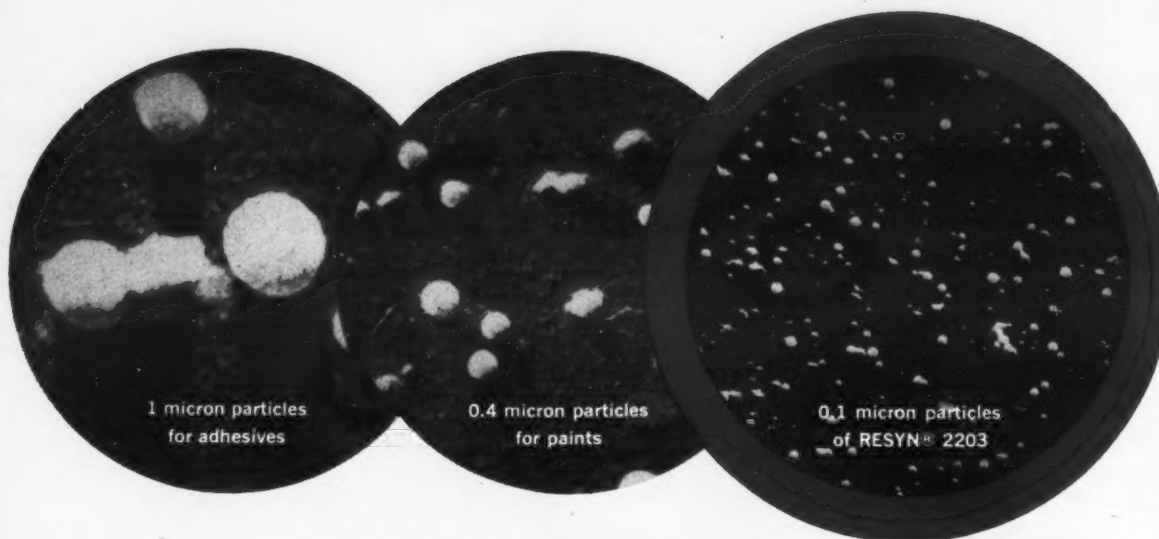
**"The Seaway promises to reduce chemical shipping costs to Europe for inland producers as compared to the current combined rail-water route, but these costs**

*Turn to next page*

ANNOUNCING

# VINYL-ACRYLIC

COPOLYMER LATEX



## a further refinement in particle size

RESYN 2203 is a new vinyl-acrylic latex with particles that average 0.1 of a micron in size. Many times smaller than those of vinyl acetate emulsions.

This refinement in particle size greatly increases surface area. As can be seen from the microphotographic comparison. Greater binding power results. Film clarity increases. Water resistance also improves.

RESYN 2203 is internally plasticized. Films are glossy and exhibit good strength and flexibility. Some promising uses: coating for paper, leather finishing, binder for nonwoven fabrics. Like to investigate? Write for a sample and data sheet.

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Check 1793 opposite last page.

### St. Lawrence

From preceding page

will still be higher than from plants located on the East Coast or the Gulf Coast."

On rate differentials he says: "In discussing the difference of rates (from inland ports to Europe and from East Coast ports to Europe) there is a wide difference in opinion. Estimates range all the way from equal rates (from the Lakes or from the East Coast) to a differential of \$5 per ton premium from Chicago.

"When we compare the distance to Rotterdam from Chicago with that to Rotterdam from New York, and recognize that delays from locking may increase transit



Dow's H. G. Miller (left) and Canadian Industries' Douglas Walkington

time up to twenty-four hours over comparable distances on the open sea, a differential from Chicago seems warranted. However, when we look at the facts we find that the rates to European markets from Montreal, New York and most other Atlantic ports are equal. Even more significant is the fact that the chemical rates from the Gulf to most European markets are equal with those from the East Coast. It would appear that the distance arguments would support only modest differentials, if any, in Great Lakes freight rates.

"Two other arguments for differentials cannot be rationalized so easily. These are the two most significant limitations of the Seaway. First is the limitation in depth which will permit vessels to load only on a 25.5 foot draft. The second factor is the seasonal availability of the waterway. These two factors would tend to indi-

To page 71

Olin M  
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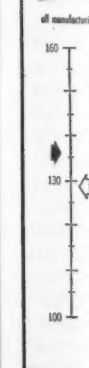
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## Olin Mathieson's Logan Predicts '58 Sales Hike; Cites Five Contributing Factors

"Five facts," says Olin Mathieson v-p John O. Logan, "point to a probable 1958 sales increase of five percent over 1957."

Speaking at the 5th annual marketing conference of the National Industrial Conference Board, Logan continued, "Dollar sales of this grouping (Chemical and Allied Products, SIC Group 28) for the first half of 1957 were four percent ahead of the similar period in 1956. Industry expectations for the second half, according to a recent survey by the Manufacturing Chemists' Association, are for a ten percent increase over the first six months. If performance matches these expectations, sales for the year will be close to \$25 billion, or nine percent above 1956."

"The prospect for an extension of this uptrend into 1958, in my opinion, is good. I do not look for anything sensational, such as the 18 percent jump from '54 to '55, but I think the gradual increase that has been underway since then will continue. Specifically, I believe a rise in the general neighborhood of five percent in total sales of chemicals is a reasonable expectation for 1958."

Reasons for this "tem-

pered optimism":

■ "Present indications, despite the stock market's jitters, seem to point to another year of good general business in 1958"

■ "Customer inventories are at an abnormally low level."

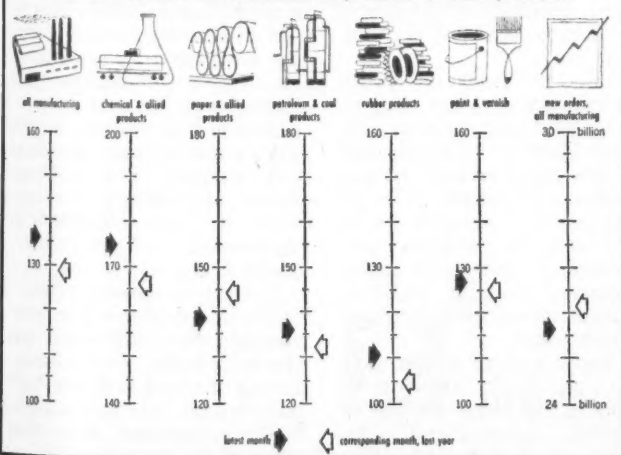
■ "Certain chemical-consuming industries — textiles, paper and pulp, residential building, for example — which have been undergoing their own private recessions recently will show some recovery in 1958"

■ "The industry's record capital expenditures of the past two years should serve as a stimulus to chemical sales in '58. Expenditures for new plants in 1956 and 1957 will total about \$3.3 billion, or 13 percent of annual sales. The rule of thumb in the chemical industry is that \$1 of new facilities will generate about \$1 of annual sales. On this basis, capacity of the chemical industry will be in excess of estimated sales by about 15 percent at the end of 1957. By the end of 1958, capacity will have risen to a level about 25 percent over 1957 sales"

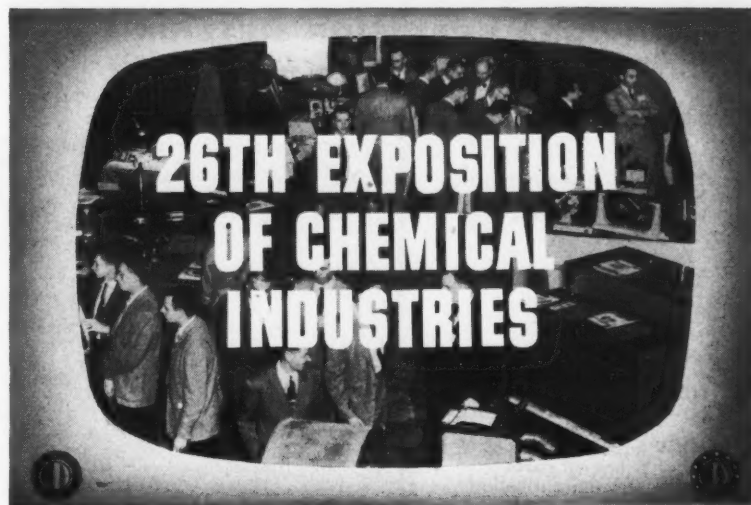
■ "Fifth, despite widespread over-expansion, I believe that there will be more increases than decreases in chemical prices in 1958."

### chemical business INDEX

Production indices, from latest available Federal Reserve Board figures, based on 1947-49=100. New Orders, All Manufacturing, (last column) from latest available Department of Commerce data.



## The TIME and PLACE to see the top "program" serving the process industries



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Here it is . . . the greatest concentration of new and important developments of vital interest to management, design, production and research personnel—all under one roof. It will pay you and your associates to see first-hand the more than 500 exhibits (4 floors) that will feature new methods, new processes, new products, new ideas, new ways to cut costs, increase production, and new ways to improve your products. This tremendous concentration of technical information will allow you to view, judge, and compare the latest advances in chemical materials, machinery and equipment. Specialized sections of laboratory apparatus and supplies, and chemicals and raw materials have been arranged for your convenience.

There is no quicker or more effective method of acquiring new ideas and valuable information than a few days spent at this exposition. The advantages to you and your company will be a profitable investment.

Reserve time and place now on your calendar.

**26th EXPOSITION OF CHEMICAL INDUSTRIES**  
**NEW YORK COLISEUM, DECEMBER 2-6, 1957**

For advance registration, write to  
International Exposition Company, 480 Lexington Ave., New York 17, N. Y.

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# NEW DIAPHRAGM PUMP\*

**PROVIDES PRECISION METERING  
AND PROPORTIONING OF FLUIDS**

## Versatile . . .

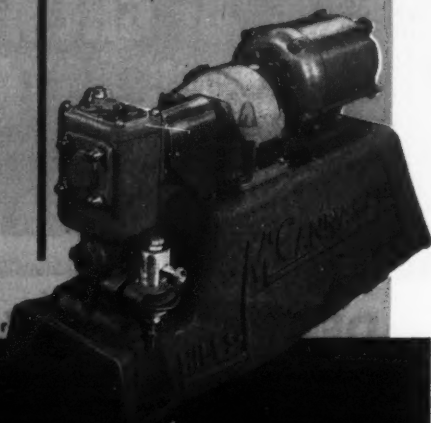
NEW high pressure range  
NEW broad capacity range  
NEW wide operating  
speed range

**Cuts maintenance  
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NEW Teflon-faced  
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struction  
NEW liquid end free of  
frictional parts  
NEW lifelong lubrication

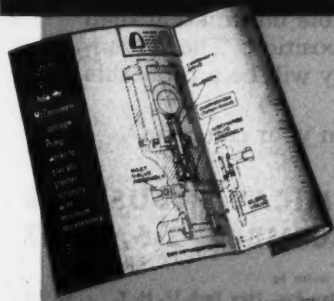
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NEW precision for small  
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NEW stepless stroke control



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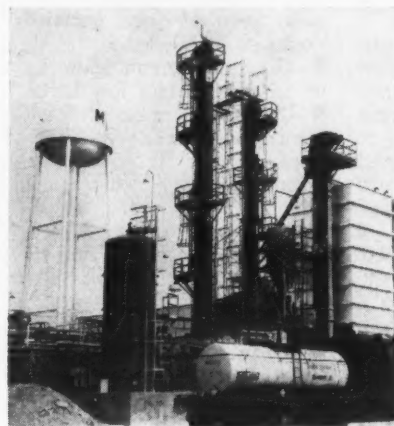
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Write for "A New Concept in  
Precision Metering and Propor-  
tioning of Fluids", booklet #361.

Hills-McCanna Company 2370 West Nelson Street, Chicago 18, Illinois

Check 1795 opposite last page.

chemical  
business

**Marketing**



Metal Hydride's new sodium borohydride unit at Danvers, Mass.

## Five More US Chemical Makers Join High-energy Fuel Business

Within a period of just three days, five chemical makers made public their plans to get into the high-energy fuels field to one degree or the other.

The most determined push is being made by American Potash, National Distillers, and Food Machinery, who have announced formation of a new company to produce the new "zip" fuels for the Air Force.

The new firm — tagged AFN, Inc. — holds an Air Force contract for the development and pilot-plant production of various boron fuels. The first operations will be at the Henderson, Nev., plant of American Potash.

Hooker Electrochemical and Foote Mineral, too, have announced a rather more cautious move in the direction of the exotic fuel business. The companies report that they are "exploring possibilities for the development, production, and sale of components of high-energy fuels."

One of Hooker's prime contributions to the venture is the fact that it owns Oldbury Electro-Chemical, said to be the world's largest maker of chlorates. Current production includes such products as sodium perchlorate, potassium perchlorate, sodium chlorate, potassium chlorate, and perchloric acid.

Foote brings to the project its basic position in lithium, as well as its research background and pilot production experience

in lithium perchlorate and ammonium perchlorate. The company owns extensive lithium ore deposits as well as lithium salt and metal production facilities.

### Metal Hydrides Opens Plant

Another move in the fast-paced exotic fuel field is the opening of Metal Hydride's sodium borohydride operation at Danvers, Mass. Costing something over \$5 million, the plant began producing early in October.

Under the terms of its Navy contract, the company will deliver \$9.2 million worth of sodium borohydride to Olin Mathieson's high-energy fuel plant at Niagara Falls.

The new Danvers operation was put up on a site bought and improved by Metal Hydrides. The government furnished the \$4.4 million worth of equipment. MHI's investment is on the order of \$1 million.

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## St. Lawrence

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cate that it will be more costly to operate from the Seaway as compared with East Coast ports on the European run.

Two preliminary studies have been made on the premium cost of operating through the Seaway as opposed to East Coast ports. Both arrived at a differential cost in a range of one to three dollars per long ton.

"It should be recognized, however, that there are strong arguments for equal rates from the St. Lawrence Seaway and the competitive picture may result in equal rates since today's rate structure from other ports cannot be defended on a mileage basis."

**On imports** Walkington explains: "We cannot look forward with any surety to really substantial reductions in the cost of transporting chemicals from Europe just because of the enlarged canal. On higher priced chemicals, which usually move in relatively small quantities, the effect will probably go unnoticed.

"It is on the big bulk, cheap chemicals that there is an element of uncertainty. Here the question of trans-shipment enters the picture. For example, phosphate rock is shipped from Florida to Sorel or Montreal in large ships and is transferred to smaller ones for the trip to Lake Ontario via the present canals — at a cost of around \$1.25 to \$1.50 per ton. The cost of trans-shipment would be saved if the original vessel could carry cargo to its ultimate destination. However, this brings in the problem of return cargo without which the voyage would probably be unprofitable.

"We can picture the Seaway as a new chemical which in some ways is like, and in others unlike, older products. What it will do and at what cost, will be investigated by potential users. In time its proper place in industry will be found."

## New service for Organic Chemical users



For the specialized service required by consumers of organic chemicals, call Olin Mathieson. The Organic Chemicals Division now makes available a team of experts, ready to give you the technical assistance needed in the handling and use of this special group of chemicals.

Production is at Olin Mathieson's modern hydrocarbon plant in Brandenburg, Kentucky; local stock points are located in key industrial areas. For data sheets and shipping information, write today.

Ethylene Oxide • Ethylene Glycol • Diethylene Glycol  
Triethylene Glycol • Polyethylene Glycols (Poly-G's)  
Glycol Ether Solvents (Poly-Solv's) • Ethanolamines  
Surfactants (Poly-Tergents) • Ethylene Dichloride  
Dichloroethylether.

Poly-G®, Poly-Solv® and Poly-Tergent are trademarks



**ORGANIC CHEMICALS DIVISION**

OLIN MATHIESON CHEMICAL CORPORATION  
ONE PARK AVENUE, NEW YORK 16, NEW YORK

Check 1796 opposite last page.





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### • Compact

Minimum diameter due to maximum free space velocity  
Minimum height due to maximum efficiency with few contact stages

### • Efficient

Intimate gas-liquid contact  
High heat transfer rate  
Close terminal temperatures  
Maximum cooling effect  
High absorption rate  
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### • Economical

Low liquid consumption  
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Pressure—1 p.s.i.a. to 465 p.s.i.a.  
Temperature—to 3500° F.  
Capacity—100 to 200,000 C.F.M.  
Installation—vertical or horizontal  
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### • Adaptable

Various process cycles  
Clear liquids or slurries  
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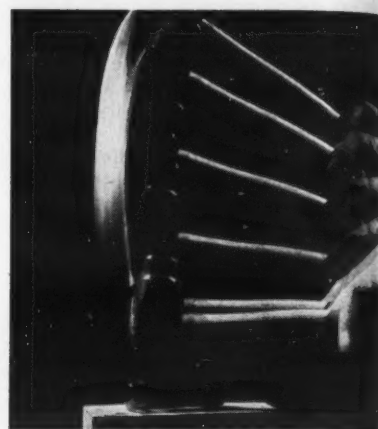
PEABODY LIMITED • LONDON, S.W. 1, ENGLAND

7-120

Check 1797 opposite last page.

chemical  
business

## Our Growing Industry



Polycarbonate molding withstands repeated blows by heavy hammer

## GE Plans Semi-works Production Of Polycarbonate Resins

Although it's not yet officially announced, construction has begun on a semi-works unit to produce larger quantities of GE's new polycarbonate resins. The operation is designed by Crawford & Russell, builders of the initial pilot plant.

The new operation won't enable GE to produce anything close to commercial quantities of the material but will make enough resins available for the company to do more complete market evaluation. All of the current production of the material, tradenamed Lexan, is being retained for GE's own lab tests, although potential users of the material have been clamoring for samples to do their own testing.

Evidence of growing interest in the polycarbonates: Both British Celanese, Ltd. and Eastman have recently taken US patents on polycarbonate developments.

## Commerce Oil Plans \$50 Million Refinery

Commerce Oil Refining has awarded The Fluor Corporation a contract for design, engineering, and construction of a \$50 million, 43,000 bpd refinery at Jamestown, Rhode Island. The installation will occupy a 600-acre site in Narragansett Bay, near Providence.

More than 60 percent of

the unit's production will be 100-plus octane gasoline, the remainder will be distillate fuel oils and miscellaneous products.

Construction is scheduled to begin soon, with completion set for early summer, 1959.

## Westvaco To Build Dry Bleach Unit

Westvaco division of Food Machinery has released plans to construct a plant at Charleston, W. Va., for production of dichlorocyanuric acid, trichlorocyanuric acid and the sodium salt of dichlorocyanuric acid. The unit is scheduled to go on stream in mid-1958, will have an annual capacity of 6 million pounds.

The materials, which have a high percentage of available chlorine, are used for the manufacture of dry household bleaches, commercial laundry bleaches, and germicidal compounds.

## Allied Nylon

Allied announces for the production of roactan Va., a Miller, expansion plant's 60 million

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## Allied Chem To Double Nylon 6 Capacity

Allied Chemical has announced plans to double — for the second time — production capacity at its caprolactam plant at Hopewell, Va., according to **Glen Miller**, Allied president. The expansion will boost the plant's output to an annual 60 million pounds.

The unit is operated by the company's National Aniline division.

Although the facilities were originally planned to produce material only for Allied's use, caprolactam, the monomer for Nylon 6, is now available to the industry.

Beside caprolactam, the Hopewell plant makes cyclohexanone, cyclohexanol, and adipic acid.

## Dow Joins High-Density Poly Makers

Dow, long-time holder of a process license from Dr. Ziegler, has finally announced construction of a high-density polyethylene unit.

The plant, to be completed in October, 1958, will be built at the company's Bay City, Mich., division.

The operation will get feed stock from Dow's petrochemical group and from the Bay Refining Company, a wholly-owned Dow subsidiary.

## Decides on Site

And National Petro-Chemicals has decided on a site for its newly-announced intermediate-density, high-pressure polyethylene unit (CHEMICAL PROCESSING, Oct., page 62). The 75 million annual pound operation is to be constructed on a 200-acre plot on the Houston Ship Canal, Houston, Texas. Ethylene feed stock is to be supplied by Phillips from its new ethylene plant at Sweeny, Texas.

# NOW! In Quick-Dissolving Non-Caking FLAKES

## SOLVAY ANHYDROUS U.S.P. FLAKE SODIUM NITRITE

Now available at no increase in price—anhydrous U.S.P. sodium nitrite in an exclusive time and labor saving flake form! For the first time you can get anhydrous sodium nitrite that will dissolve rapidly, as well as store without caking. This new SOLVAY product is now packed in 400-lb. fiber drums as well as 100- and 400-lb. steel drums and 100-lb. bags to meet your individual needs.

Write, or fill in coupon, for prices and the name of your nearest dealer.

Inspection Sample Available—  
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Sodium Nitrite • Caustic Soda • Calcium Chloride  
Chlorine • Caustic Potash • Potassium Carbonate  
Sodium Bicarbonate • Chloroform • Vinyl Chloride  
Methyl Chloride • Ammonium Chloride • Methylene  
Chloride • Cleaning Compounds • Hydrogen Peroxide  
Ammonium Bicarbonate • Aluminum Chloride • Carbon  
Tetrachloride • Monochlorobenzene • Para-dichlorobenzene  
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Please send me:

- ☐ Inspection sample of SOLVAY flake Sodium Nitrite.  
☐ Prices and the name of my nearest dealer.

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DS-11

Check 1798 opposite last page.



**IF YOU'RE  
HANDLING  
CORROSIVE  
FLUIDS...**

**K**  
**DUCTILE IRON  
FITTINGS  
ARE A MUST!**



A nationally known chemical manufacturer reports that Kuhns ductile iron pipe fittings lasted six times longer in raw water lines than ordinary fittings. The brackish water at 80° C. contains 100-2000 parts chloride per million.

They also report excellent results with flanged ductile iron fittings on pumps operating up to 200° C. Other uses reported for Kuhns "DI" fittings include handling oleum at 40° C. to 100° C., steam at 125 psi, steam condensate, nitrogen at 175 psi, carbon dioxide at 150 psi, propane, ammonia, isobutylene, isobutane, and all weak acids.

#### SAFETY FACTOR

The smooth walls of Kuhns ductile iron fittings, their basic resistance to corrosion, high yield strength of 45,000 psi and excellent thermal shock resistance mean greater plant safety and lower maintenance costs wherever corrosion or volatile fluids are handled.

LISTED BY UNDERWRITERS' LABORATORIES, INC.

 <p><b>"K" Flanges and Flanged Fittings</b> Elbows, base elbows, 45° elbows, side outlet elbows, tees, side outlet tees, and reducers in straight and reducing sizes. Pressure rating, 500 psi by Underwriters' Laboratories, Inc. Flat faced flanges shipped as standard. Extra heavy flange dimensions and raised faces available on request. Look for the "DI 500" on each. Complete range of sizes through 12".</p>	 <p><b>"K" Screwed Fittings</b> Pressure ratings listed by Underwriters' Laboratories, Inc. STEAM AND OIL AT 550° F. 1/4" to 3" ..... 300 lbs. LIQUID AND GAS AT 150° F. 1/4" to 1" ..... 2000 lbs. 1 1/4" to 2" ..... 1500 lbs. 2 1/2" to 3" ..... 1000 lbs.  NOTE: These fittings are excellent for liquefied petroleum gas systems. Look for the "DI 300" on each.  *Ductile iron fittings are available in any size in Kuhns' complete cast iron line, 1/4" through 12".</p>
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From the melt in modern electric furnace through to critical inspection, these fittings are made in accordance with A.S.T.M. specifications A-339-55, A-395-55T to provide nodular structure and highest quality to meet industry's strictest requirements.

"K" fittings are available nationally through better wholesalers.

**K THE KUHNS BROTHERS CO.**  
1800 McCall Street • Dayton, Ohio  
1887—70 Years of Continuous Progress—1957

Check 1799 opposite last page.

chemical  
business

**Finance**

## Integrated Titanium Producer To Boost Parents' Profits

**William R. White**  
Market Analyst, Hornblower & Weeks

Confidence in a growing demand for titanium in the years ahead is reflected in the recent decision of three leading producers to combine their efforts in formation of Mallory-Sharon Metals Corporation.

The new company is jointly owned by P. R. Mallory & Co., Sharon Steel and National Distillers & Chemical Corporation. Consummation of the plan for grouping facilities in a new company with assets in excess of \$55 million is anticipated before the end of the year.

**National Distillers** has had a contract with the Atomic Energy Commission to supply a million pounds of zirconium sponge annually for five years. The plant at Ashtabula, Ohio, designed to produce 10 million pounds of titanium and 2 million pounds of zirconium sponge annually and just coming into production is to be transferred to the new concern.

**Consolidation** of the National Distillers project with that owned by Mallory and Sharon is expected to provide more efficient management and achieve operating economies designed to help solidify the new company's competitive position.

National Distillers is expected to report net profit this year of about \$2.30 a share, compared with \$2.11 for 1956, and an even higher figure is envisioned for 1958. Tentative forecasts for next year suggest the possibility of attaining net profit of \$2.75 to \$3 a share. Delays in reaching diversification objectives and slackening in chemical activities in the third quarter adversely affected recent operations. Expansion plans call for annual expenditures of about \$25 million for several years in enlargements of facilities for chemicals and byproducts. Such a program necessitates adherence to a conservative dividend and eventually may involve new financing. The dividend rate of \$1 a share was supplemented by distributions of 2 percent in stock last year and again this year.

**Sharon Steel**, larger of the

two other interested concerns participating in the titanium venture, is a semi-integrated producer concentrating on output of hot as well as cold rolled strip and a small volume in plate and stainless steel.

Net profit this year may fall back to about \$4.50 a share, from \$6.28 in 1956. Maintenance of the indicated \$3 annual rate is anticipated.

**P. R. Mallory & Company**, whose shares recently were listed on the New York Stock Exchange, has experienced a pronounced uptrend in sales in recent years, reflecting rapid development of the electronics industry. Shipments have risen to more than \$70 million a year from about \$20 million in the last decade.

**Earnings** seem likely to range comfortably above the \$1.99 a share after preferred dividends reported for 1956, although estimates are not readily available because of the consolidation of Radio Materials Corporation of Chicago a few months ago. Dividends are being paid at the rate of \$1.40 a share annually.

For further investment information on Mallory-Sharon Metals, write Hornblower & Weeks, 40 Wall Street, New York 5, N. Y. or check 1800 on form opposite last page.

CHEMICAL PROCESSING



## Spotlight on people

**Clowes M. Christie**, president of American Latex Products Corporation and Pacific Polymers, is newly elected president of the Dayton Rubber Company. Christie succeeds **A. L. Freedlander**, Dayton president since 1936, who will continue to serve as chairman of the board.

Appointments at American Cyanamid make **Allan B. Clow** v-p for marketing and **General Anthony C. McAuliffe** v-p for engineering and construction. More news at Cyanamid . . . **Dr. William H. Bowman** becomes general manager of organic chemicals division, while **Neil B. Conley** is named assistant general manager for division.



Bowman

**J. Paul Kirk** is elected to board of directors at National Lead Company.

Du Pont's **Robert J. Thompson** will retire at the end of this year. Succeeding him as director of sales for Freon products division is **William A. Bours III**.

New board directors at Foster Grant are **Solomon R. Baker**, **Milton Pollack**, **Dr. Robert L. Purvin**, and **William H. Raye Jr.**

And at Columbia-Southern, subsidiary of Pittsburgh Plate Glass, **Joseph A. Neubauer** is elected president.

**Robert Kirk** joins Amoco Chemicals as manager for international sales of company's products.

**C. M. Schwitter**, former supervisor of Far Eastern and Latin American technical developments, is named to head up the market research activities of International Nickel. Schwitter will be assisted by **George Hoobler**.

And at Cosden Petroleum Corporation, **Richard M. Johnson** is newly elected vice-president.

**George F. Sharrard** joins Michigan Alkali division of Wyandotte as manager of marketing research.



Ballman

**Donald K. Ballman** is promoted to position of director of sales for Dow Chemical. Ballman succeeds **Donald Williams** who recently was appointed director of corporate relations.

**Raymond F. Evans** becomes new president of Diamond Alkali with the resignation of **John A. Sargent**.

**Francis J. Sergeys** is appointed v-p in charge of development for Grace's research and development division.

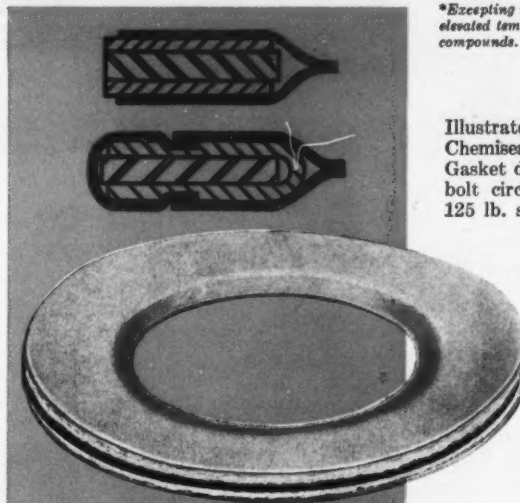
Jefferson Chemical appoints **William C. Bédouit Jr.** manager, market development for commercial development division.

**Ernest E. Holdman** is named vice president and general manager of Heyden Newport International, a newly formed division of Heyden Newport Chemical.

## Chemiseal® Gaskets

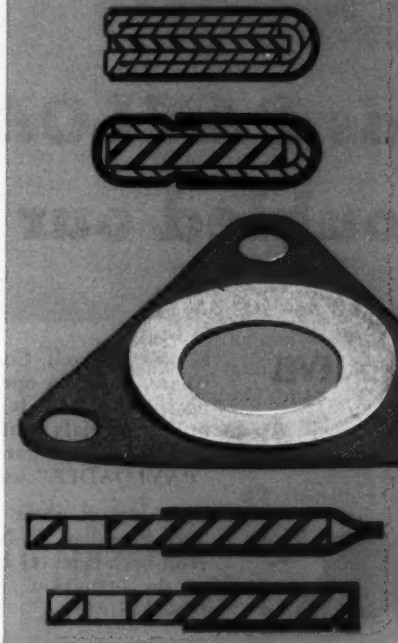
... with protecting Jackets of du Pont TEFLON, are impervious to all known chemicals\*. They are made with a variety of filler constructions to suit every connection problem—every pipe and nozzle material requirement—whether glass, ceramics, stainless, Karbate, Haveg, glass-lined steel, etc. That is why Garlock 8764 Chemiseal Gaskets have become the standard choice of the process industries.

\*Excepting molten alkali metals, fluorine at elevated temperatures and complex halogen compounds.



Illustrated at left is the standard Chemiseal slit-envelope Ring type Gasket designed to fit inside the bolt circle of flanges drilled to 125 lb. standards and made for all standard pipe sizes up to 10" I.D. Stocked for all Pfaudler and Glas-cote standard nozzle sizes from 1½" to 10" I.D.

Also available as shown with double jacket protecting O.D. as well as I.D. against corrosion.



Illustrated at left is Chemiseal formed-shield Ring type Gasket for large diameter glass-lined steel or special material nozzles and irregular shaped openings. Also available as shown with double formed-shield protecting both O.D. and I.D.

Illustrated at left are Chemiseal Gaskets with full face filler with bolt holes, for standard Corning conical flanges. These gaskets seal with unusually low bolt loads. Shown are both slit-envelope and milled-envelope types.

Milled-envelope type fits flush with the pipe I.D. and provides minimum impedance to flow. This type Jacket is supplied either with full face filler or with filler to fit inside bolt circle on standard 125 lb. flanges.

Write for Catalog AD-154.

United States Gasket Company  
Camden 1, New Jersey

# United States Gasket

Plastics Division

OF THE GARLOCK PACKING COMPANY

Check 1801 opposite last page.

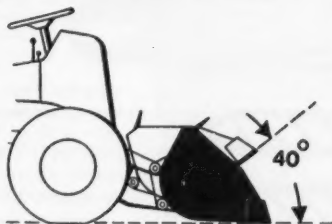
**16-YEAR  
PAYLOADER  
USER**



**"This PAYLOADER feature\*  
nearly doubled our daily output..."**

**\*40° ROLL-BACK AT GROUND LEVEL**

Develops powerful digging force — brings bucket close to machine for maximum stability and carrying capacity, and least spillage loss while transporting loads.



F. W. Tunnell Company, producer of glue, grease and fertilizer, has been operating at the same Philadelphia location for nearly 80 years. It is also a pioneer user of tractor-shovels for bulk materials handling, having bought one of the original "PAYLOADER" tractor-shovels in 1941, and been continuous "PAYLOADER" users ever since.

Speaking of their two new-style model HA units, Tunnell's Vice President, E. N. Angus, says, "This 'PAYLOADER' feature [roll-back bucket] has nearly doubled our daily payload in most of the operation . . . gives us continuous delivery with very low downtime."

Smallest of the "PAYLOADER" line, the Model HA has a 2,000 lb. carrying capacity. Other operating features include hydraulic load-shock-absorbers, torque converter drive, rear-wheel steering, one-lever bucket control, two speeds in either direction. Your nearby Distributor will gladly demonstrate how a Model HA or larger "PAYLOADER" can improve *your* handling methods.

**THE FRANK G. HOUGH CO.**

744 Sunnyside Ave., Libertyville, Ill.

Send more "PAYLOADER" information on:

- ☐ Model HA (2,000 lb. carry capacity)  
☐ Larger models (up to 9,000 lb. carry capacity)

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TITLE \_\_\_\_\_

COMPANY \_\_\_\_\_

STREET \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_

11-A-4



**PAYLOADER®**

MANUFACTURED BY  
**THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.**

SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

Check 1802 opposite last page.



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NOVEM



creased production and reduced imports by \$20 million.

Despite all this development of local chemical industries, imports still supply about two-thirds of the chemicals and chemical products used in Latin America. Imports have averaged \$500-million a year in the last few years, exceeding the prewar volume by more than 300%. However, it is significant that the value of chemical imports has dropped 12% from 1951 to 1955. This decline is partially due to foreign exchange problems, but by and large the increase of local production has been reducing the need for imports.

US private investment and the transfer of technical knowledge have contributed in a large measure to the development of the Latin American chemical industry. It is estimated that US capital investment in Latin American chemical manufacturing now totals nearly \$400 million. In Brazil alone we find such well-known US chemical and pharmaceutical firms as Du Pont, Koppers, Union Carbide, American Home Products, Squibb, Parke Davis, and Merck. Also in Argentina, Cyanamid Inter-American Corp. is erecting a plant for local needs. Celanese is starting nylon production in Mexico at

a rate of over 1,000,000 pounds a year, and Parke Davis recently began production of a complete line of their pharmaceutical products in Chile. These are just some of the chemical enterprises backed by US capital which are getting underway. There is also a sharp rise in the inflow of investment capital from Western Europe. British, French, German, and Italian investors are building chemical plants in various Latin American Republics.

The Latin American chemical industry is characterized by dynamic growth. It is small compared with its counterpart in the US, but we must remember that Latin America is just now approaching the same level of industrialization that we experienced 50 years ago. It was during this same period in the evolution of our technical development that the production of chemicals became an important factor in America's industrial scene.

If we look at the Latin American chemical industry in this light, we can predict a future which might very well exceed the rate of US chemical growth in the past 50 years.

We at W. R. Grace & Co. expect to play an active role in that growth. ■

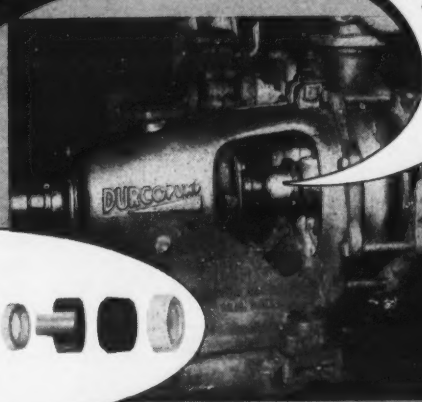
#### Foreign operations

Special report of 237 pages, reported to be first of its kind issued, tells how five leading companies organize and administer their foreign operations. Ranging from initial planning to full development of marketing, production, and financial policies, each case study is practical record of achievement in overseas activity. To obtain IMA Special Report 1, remit \$4.50 (AMA members \$3.00) direct to International Management Association, 1515 Broadway, Times Square, New York 36, N.Y.

**CHEMICAL PROCESSING's** Editors are always interested in the opinions of our readers. What are your views on the subjects we cover each month?

"Over The Reader's Shoulder" (page 8) will publish as many letters each month as is possible. Let us hear from you.

*another CHEMPRO first...*



*Parts Interchangeable*  
**ON**

**CHEMPRO "Wedge-Lock"**  
**EXTERNAL AND INTERNAL SEALS**

Chempro "Wedge-Lock" Line of external and internal mechanical seals is now completely interchangeable in parts, with the exception of the stator bushing, for any given shaft size. This important cost- and time-saving feature is another Chempro **FIRST**, resulting in

- Savings Through Reduction in Spare Parts Stock
- Gives You More Insurance Against Down-time

Chempro "Wedge-Lock" Seals give highly economical service on pumps handling acids, caustics and other liquids and slurries at temperatures from -80° F. to 500° F., from vacuum to 100 psi. Seal faces are always within the stuffing box, eliminating dangerous spray hazards.

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CHEMPRO  
ADVANTAGES**

- ① Simple In Design—Only 8 Parts
- ② Installed In Only 20-30 Minutes
- ③ Seals Completely Interchangeable With Packing
- ④ Low Power Costs—Minimum Friction Load
- ⑤ Flushing, Cooling and/or Lubricating Can Be Supplied On All Seals

Write for Bulletins CP551 and 575

**CHEMICAL & POWER PRODUCTS, INC.**  
The Original Fabricators of Teflon Packings and Gaskets  
9 Broadway, New York 4, N. Y.

Check 1803 opposite last page.





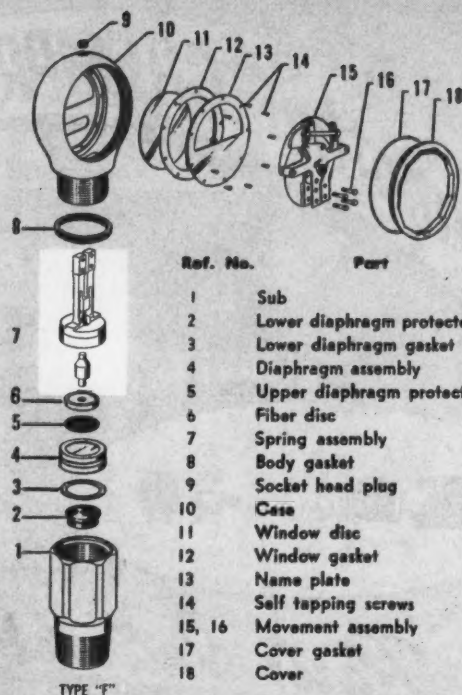
**NEW SOLUTIONS**

of processing problems

## Pressure-gage life boosted from 1-5 weeks to 15 months

**Vibration-resistant gage withstands violent pressure fluctuations that caused trouble with conventional type in Davison catalyst plant**

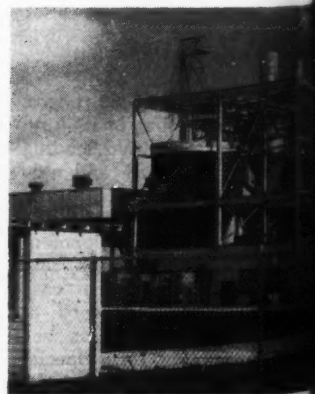
Pressure gage employs a patented spring of forged steel



**GORDON WEYERMULLER**  
Associate Editor  
With **ELMER E. BOEHM**  
Chief Plant Engineer  
Davison Chemical Company  
Div. of W. R. Grace & Co.  
Lake Charles, Louisiana

**Problem:** Only one to five weeks service was being obtained from high-pressure gages in service at the Lake Charles, Louisiana, plant of Davison Chemical Company. Silica-alumina — a fluid catalyst used in petroleum refining and in other applications — is manufactured at this plant. Process calls for high temperatures and closely regulated pressures of 1500 psig.

Under these conditions silica-alumina slurry is pumped and pressure-atomized into a spray-drying chamber at approximately



Periodic check is made of one pressure gage in service at Davison plant

800°F to 1000°F. This leaves particles of 60 microns or larger. Surging silica-alumina a great deal with triple at a rate occur. The tions on indicating frequent cracked mis-calibration.

**Solution:** heard about successfully work in on gage, called crude pro fluid sur used to c bottom of must not pressure kicked back mations in get as high.

On the h performan oil-drilling son install the silica October 19

Gage is principle f high-press ploys no B a patented steel. Entire oil, and a phragm p from enter

Davison silica calls for clo

NOVEMBER

800°F to drive off the moisture. This leaves spheroidal particles of silica-alumina about 60 microns in diameter.

Surging pulsations of the silica-alumina slurry result in a great deal of vibration. Even with triplex pumps, pulsations at a rate of 133 per minute occur. These violent fluctuations on conventional gage indicating mechanisms caused frequent diaphragm failures, cracked cases, and promoted mis-calibrations.

**Solution:** Davison engineers heard about a gage being successfully used in high-pressure work in oil-well drilling. This gage, called Type F, is used in crude production to take the fluid surge of duplex pumps used to circulate fluid to the bottom of a drilled hole. They must not only indicate pump pressure but also pressure kicked back from gaseous formations in the earth. This may get as high as 10,000 psig.

On the basis of the excellent performance of the gage in oil-drilling operations, Davison installed one such gage in the silica-alumina plant in October 1955.

Gage is built on a different principle from a conventional high-pressure gage. It employs no Bourdon tube but has a patented spring of forged steel. Entire case is filled with oil, and a self-contained diaphragm prevents line fluid from entering any part of gage

*To next page*



## SAVE ON TOWER MAINTENANCE

### PACK WITH LAPP PORCELAIN RASCHIG RINGS

Lapp raschig rings are smooth, completely vitrified, strictly non-porous and iron free. They are chemically inert to acids of all concentrations (except hydrofluoric); there can be no crumbling from capillary pressures nor absorption of liquids to contaminate later processing. This combination of characteristics assures an indefinite life chemically.

Physically, Lapp raschig rings are tougher against damage from handling and tower operation than other ceramic rings or other packing shapes.

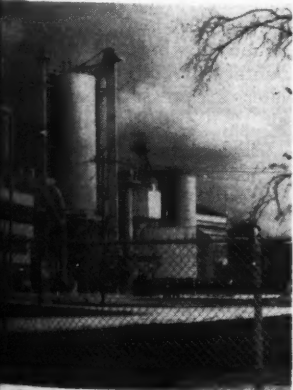
Lapp customers report longer continuous service and greater purity of product from their Lapp packed towers . . . with greatly reduced maintenance costs.

**WRITE** for our bulletin describing the characteristics of Lapp Chemical Porcelain. See

*how you can save with a trouble-free system of Lapp Porcelain. Lapp Insulator Co., Inc., Process Equipment Division, 328 Chestnut St., Le Roy, New York.*

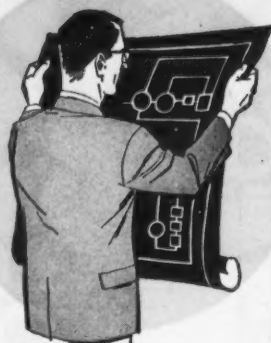
**Lapp**  
**CHEMICAL**  
**PORCELAIN**

Check 1804 opposite last page.



Davison silica-alumina plant. Process cells for closely regulated pressures at 1500 psig





Partial List of  
Material Processed  
with Allis-Chalmers  
Heat Transfer Equipment

- Limestone
- Lime
- Dolomite
- Magnesite
- Alumina
- Bauxite
- Manganese Oxide
- Iron Ore
- Phosphates
- Refractories
- Foundry Sand
- Petroleum Sand
- Petroleum Coke
- Fuller's Earth
- Nickel Ores
- Copper

## How Allis-Chalmers Can Help You Cut Heat Transfer Costs

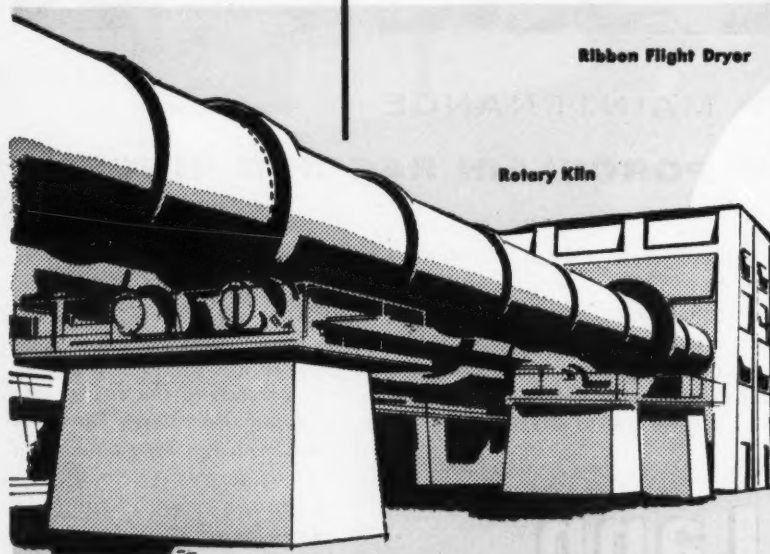
Obtaining increased production, lower processing costs and improved product quality is more than a matter of installing the best heat transfer equipment. Maximum utilization of that equipment also calls for an *efficient flow design*. You get *both* from Allis-Chalmers.

### A-C Engineers Work With Your Staff or Consulting Engineers

Allis-Chalmers engineers concern themselves with overall operation . . . the evaluation of variables . . . plant design . . . the integration of interdependent equipment into a complete process.

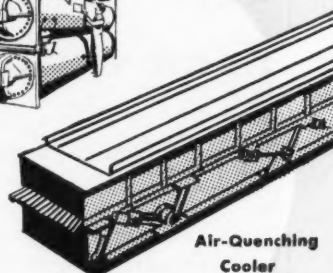
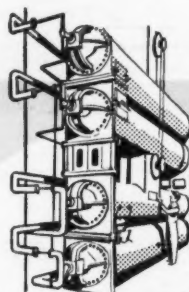
Pre-recommendation research, testing and, of course, expert installation and localized field service are also available from Allis-Chalmers—the world's leading manufacturer of rotary kilns, coolers and associated equipment.

Equally important is the fact that Allis-Chalmers interest in your problems is continuous. Laboratory services, periodic equipment check-up and parts service are yours for the life of the equipment — and a long life it is, too.

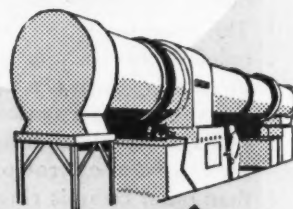


Ribbon Flight Dryer

Rotary Kiln



Air-Quenching Cooler



Rotary Dryer

You'll want Bulletin 25C6177. See your nearby A-C representative or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin.

# ALLIS-CHALMERS



A-5325

Check 1805 opposite last page.

## NEW SOLUTIONS

### Gage Life Boosted

From preceding page

mechanism. This cushions all internal parts against vibration and minimizes corrosion and wear. All parts are ruggedly constructed and operate on ball bearings. Reading window is made of unbreakable Plexiglas.

**Results:** On gage installed on a trial basis, 15 months service was obtained before maintenance was needed — compared to the one to five weeks service from previous gages. On the basis of this better than 12-to-1 length of service, three more Type F gages were installed at Davison in August 1956, and it is expected that a number of others will shortly be in use in the plant.

(Type F gages are product of Cameron Iron Works, Inc., P.O. Box 1212, Houston, Texas.)

Check 1806 opposite last page.

### Triplex direct-flow pump decreases fatty acid processing cost

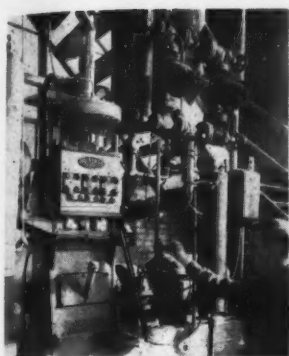
Expensive maintenance no longer serious problem

**Problem:** Handling hot fats and greases around the clock, seven days a week was too much for pumps originally installed at Emery Industries, Inc., Cincinnati, Ohio. Fatty acids were heated to 150 to 200°F and pumped into three 60'-high hydrolysis columns, where they met counter-current stream of hot water at pressures over 700 psi.

Valve refacing, and packing replacement were required frequently. Excessive plunger wear added to troubles so that high maintenance costs soon became a burden.

**Solution:** Emery's engineers selected a direct-flow, 3" stroke triplex pump. Close clearance design provides high volumetric efficiency in handling light as well as heavy liquids. Fluid-end consists of sectionalized assembly. Suction and discharge manifolds





Hot fats and greases are handled around the clock, seven days a week by this 3" stroke triplex direct-flow pump

are separate units which are bolted to forged steel working barrel. Valve assemblies are easily accessible for inspection or replacement. Removable stuffing boxes are provided to permit adapting wide range of plunger sizes to pump. Plunger is of high-alloy steel.

**Results:** After nine years of difficult operation, two original pumps are still on job giving dependable service. Expensive maintenance ceased to be problem. Corrosion-resistant valves reduced need for frequent refacing. Because all parts are constructed of stainless alloys, wear of fluid-end is minimized.

(Pump is product of Aldrich Pump Company, Dept. CP, Allentown, Pa.)

Check 1807 opposite last page.

#### FOR MORE INFORMATION

Here's what to do when you want additional details about products and services mentioned in this issue's editorial articles or advertisements.

Note the number at end of article or advertisement. Check this key number on Reader Service slip opposite last page of this issue. Fill in slip with the other pertinent information (name, title, company, address, product made). Mail to our Reader Service Department.

We'll contact the manufacturer for you. He'll send you the details direct.

# NOW!

## A BRAND-NEW CONCEPT IN FLOW TOTALIZING!



### ... THE NEW FOXBORO PNEUMATIC **FLYBALL** INTEGRATOR

#### Inherently Accurate!

- Eliminates Inaccurate "Spot Check" Counting!  
Continuous integration assures highest precision.
- Eliminates Cam and Linkage Errors!  
Unique design balances differential pressure signal directly against centrifugal force.
- Eliminates Calculations!  
Automatically extracts square root — shows totals in desired units.
- Eliminates Fire and Explosion Hazards!  
Simple, all-pneumatic operation requires no electric motors, wires, or contacts.

Now you can integrate the flow of all process fluids or plant services continuously... with new accuracy... complete safety! The all-pneumatic Foxboro Flyball Integrator completely eliminates intermittent counting and fire hazard. Its simple, force-balance operation utilizes the 3-15 psi air signal from any conventional differential-pressure flow transmitter. This signal is continuously balanced against the "flyball" force of the instrument's pneumatically-driven turbine. The square root function is automatically extracted... you read flow totals directly.

The Flyball Integrator mounts at the point of measurement or on a panel hundreds of feet away. Response and accuracy are completely unaffected by ambient temperature changes or pressure changes in turbine air supply. Ideal solution to all plant fluids accounting and in-process inventory checking. Write for complete details. The Foxboro Company, 6111 Neponset Ave., Foxboro, Mass.

# FOXBORO

REG. U.S. PAT. OFF.

#### FIRST IN FLOW

Check 1808 opposite last page.

## PRESSURE and TEMPERATURE LIMIT



**WARNING**  
with **USG** alarm gauges  
and thermometers

These instruments provide a warning signal when temperature or pressure in a process rises or falls beyond predetermined danger limits.

Limit contacts are adjustable over the entire range with a "gap" as narrow as 2%. Suitable for lights, bells, buzzers or other signaling equipment requiring 0.1 amps or less. For larger alarm or relief devices, external relays can be furnished to increase rating to 6 amps.

Instruments may also be used as limit controls and as on-off controls when used in conjunction with lock-in relays and suitable delay tubes.

Available in cast iron or phenolic turret case in 12 pressure dial graduations from 0-30 lbs. to 0-10,000 lbs. Vacuum ranges 0-30". 5 compound dial graduations from 30"-30 lbs. to 30"-300 lbs. Thermometers available in all standard mercury, vapor and gas ranges with phenolic case only.

For complete details call your nearest USG distributor... see the "Yellow Pages" of your phone book... or write the factory for descriptive literature.

**USG**  
UNITED STATES GAUGE  
Home of the SUPergauge®

Division of American Machine and Metals, Inc.  
Sellersville, Pa.

MORE THAN 50,000 TYPES OF GAUGES • SUPergauges • SOLID FRONT GAUGES • RECEIVER GAUGES • TEST GAUGES • RECORDERS • CONTROLLERS • TRANSMITTERS • PSYCHROMETERS • AVIATION INSTRUMENTS

Check 1809 opposite last page.

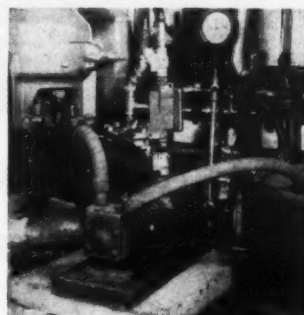
## NEW SOLUTIONS

**No maintenance necessary  
on sealeless plastic pump  
in acid, slurry handling**

Pump design brings substantial savings in maintenance

Versatility and dependability of sealeless plastic pump were demonstrated recently in applications on vitamin production line at Hoffman-La Roche, Inc., Nutley, N.J. This demonstration of pump's general effectiveness occurred in part when it was used for nine months on 30% hydrochloric acid.

Because it is self-priming, pump was especially suitable for this application as hand priming involved risk of injury to operator because of



Versatile sealeless plastic pump provides dependable, maintenance-free service

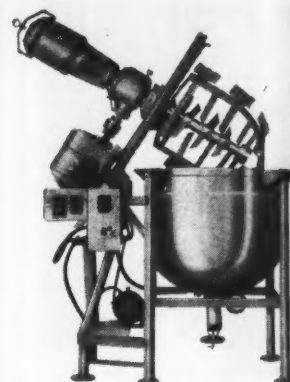
obnoxious fumes given off by the acid.

After nine months acid service, pump was transferred to a pilot operation where it handled a highly basic alkaline slurry for eight months, demonstrating its versatility as well as its dependability.

During almost two years of daily use in these rugged applications, the pump never had to be flushed out with water, never leaked, and did not require any breakdown maintenance.

Main reason for dependable, maintenance-free service lies in pump's design which eliminates stuffing boxes and shaft seals by use of flexible synthetic liner. Fluid is confined to passage formed by outer surface of liner and inner surface of plastic body block. Flanges on liner,

This typical G-W Eppenbach Agi-Mixer is fully jacketed. Hydraulic lift raises mixing assembly. Contact parts are stainless steel.



**only Agi-Mixers give  
HOMOGENIZING  
PADDLE MIXING  
at the same time!**

...That's why hundreds of users have found G-W Eppenbach Agi-Mixers just about the most useful processing equipment they possess.

Rotating paddles with teflon scraper blades work unrefined material down from the edges and top of the kettle to the high-speed, high shear Homo-Mixer homogenizing head. Here the material is drawn through small clearances between a precision turbine and stator, and ejected upward against an adjustable deflector plate. At this point the paddles again direct the material down, and this cycle is repeated until the entire mass is properly homogenized and blended.

G-W Eppenbach Agi-Mixers are built for rugged, exacting, time-saving service, and have scores of uses in processing pastes, creams, batters, slurries, gums, adhesives, pigments, resinous and latex compounds, and other viscous products.

Use coupon for free 24-page Fact Book describing the whole unusual Eppenbach line.

**GIFFORD-WOOD Co.**

Eppenbach Div., Dept. CP11  
420 Lexington Ave., New York 17, N. Y.  
Please send me your free Eppenbach Fact Book.

Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Company: \_\_\_\_\_  
Address: \_\_\_\_\_  
City: \_\_\_\_\_ State: \_\_\_\_\_

Check 1810 opposite last page.

CHEMICAL PROCESSING



## NEW SOLUTIONS

pressed to body block by end-plates, keep fluid contained within passage.

Rotor and bearing mounted on an eccentric within liner presses liner against block creating progressive squeeze action on trapped fluid. There, only polyethylene body block and Hypalon liner were in fluid contact. Since both were impervious to HCl and alkaline solutions, pumping was maintenance free.

(Seless plastic pump is product of Vanton Pump & Equipment Corp., Div. of Cooper Alloy Corp., Dept. CP, Hillside, N.J.)

Check 1811 opposite last page.

### Separator pays for itself during the first day of operation

Saves \$360 worth of CH<sub>3</sub>OH

**Problem:** Entrained methanol was being lost at rate of 500 lb/hr at plant of large eastern chemical manufacturer. Droplets were entrained in ether vapor being vented to atmosphere at 135 cfm, 35°C, and 10 to 20 psig.

**Solution:** Company installed an in-line entrainment separator at base of vent stack in a vertical upflow position.

Unit has two-stage operation. In first stage, large droplets are removed by impingement against a baffle. In second stage, fine mist entrainment is removed by controlled centrifugal action. Unit does not have any moving parts.

Separated methanol is ejected automatically by means of float trap.

**Results:** Separator has virtually stopped methanol losses. Value of product recovered on first day alone, \$360, equalled cost of unit.

Company is planning to install separators in other operations where similar problems exist.

(Model LUS Hi-ef Purifier is product of V. D. Anderson Co., 1935 W. 96th St., Cleveland 2, Ohio.)

Check 1812 opposite last page.



## Severe Problems of Handling Chemicals Solved with Aeroquip 2802 Hose Lines of TEFLON\*

**You Reduce Maintenance Costs Because Aeroquip "super gem" Fittings are Reusable**

Example: Methylene chloride is essential in the processing and packaging of insecticides and other compounds by Connecticut Chemicals (Canada) Ltd., Toronto, producer of aerosol products . . . but it's notoriously tough on all kinds of hose lines, except one—

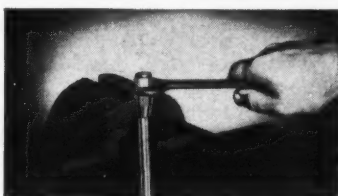
### AEROQUIP 2802 HOSE LINES OF TEFLON!

In more than a year of service, Aeroquip Hose Lines of Teflon have performed flawlessly for Connecticut Chemicals. They are excellent for use with methylene chloride as well as other chemicals and fluids for these reasons:

Chemical stability prevents deterioration and flaking of

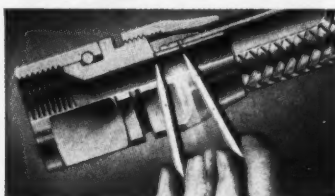
hose. Chemical inertness prevents contamination when changing from one product to another. Lubricity assures good drainage and flushing of lines. Wide temperature range accommodates -100°F to +500°F. Flexibility of hose allows various connections for quick conversions.

Aeroquip's corrosion-resistant, stainless steel "super gem" Fittings are the only detachable, reusable fittings for hose lines of Teflon. By reusing them to make replacement lines, a substantial portion of total hose line cost can be saved. The Aeroquip Distributor listed in your Yellow Page Telephone Directory has complete information, or send us the coupon below.



Only Aeroquip Hose Lines of Teflon can be assembled by hand with such simple tools as a wrench and a vise. You make on-the-spot replacements from a small inventory.

\*DuPont trade name for its Tetrafluoroethylene resin.



Leakproof, too! Unique "super gem" Fitting design provides metal-to-metal line seal (left) and lip seal (right) for perfect sealing at all pressures up to 1500 psi.

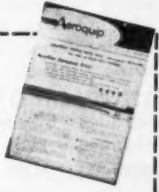
"super gem" is an Aeroquip Trademark.

# Aeroquip

**AEROQUIP CORPORATION, JACKSON, MICHIGAN**

INDUSTRIAL DIVISION, VAN WERT, OHIO; WESTERN DIVISION, BURBANK, CALIF.;  
MARMAN DIVISION, LOS ANGELES, CALIF.; GENERAL LOGISTICS, PASADENA, CALIF.; AEROQUIP (CANADA) LTD., TORONTO 10, ONTARIO.

Check 1813 opposite last page.



**Aeroquip Corporation**  
Jackson, Michigan

Please send me the following information on reusable "super gem" Fittings and Hose of Teflon:

☐ Industrial Engineering Bulletin IES-26A.  
☐ Aircraft Engineering Bulletin AEB-13.

Name \_\_\_\_\_

Title \_\_\_\_\_

Company \_\_\_\_\_

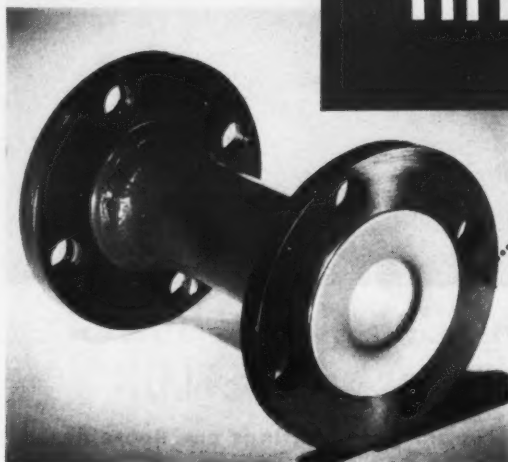
Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_



**NOW  
FROM DORE'**

## **TEFLON<sup>†</sup> LINED PIPE AND FITTINGS!**



If you are handling corrosives or require contamination-proof piping — you need Dore' Teflon Lined Piping and Fittings.

Be sure to visit our Exhibit, Booths 1295, 96 and 97, during 26th Exposition of Chemical Industries, Coliseum, New York, Dec. 2 through 6.

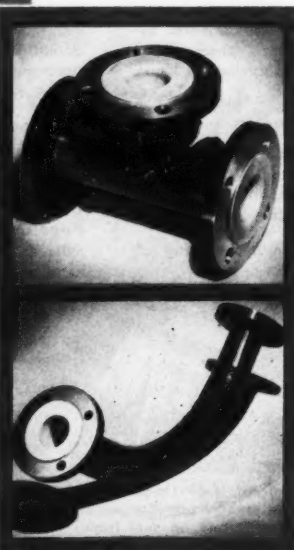
Dore', the leading molders of "Quality Controlled" Teflon Shapes, are now applying their skill and integrity to the fabrication of Teflon lined pipe and fittings.

The pure, white\* Teflon lining is tough, dense, hole-free — has no welds. The Teflon seal made by forming the liner over a raised flange face, is perfectly flat and smooth — not wavy. It covers the entire raised face and eliminates the use of an extra flange gasket. Dore' Teflon lined pipe and fittings provide corrosion-free, contamination-proof piping for an extremely wide range of commodities.

**TEFLON LINED PIPE** is available in sizes 1" through 6" — lengths to 10' with welded flanges.

**TEFLON LINED ELLS** are available in long radius, sizes 1" through 6".

**TEFLON LINED TEES\*\*** have a solid, weldless liner, sizes 1" through 6".



The Teflon seal lies flat, and smooth on the raised flange face. No extra gasket is needed for a perfect, protective seal.

Pressure Rating	400 psi
Vacuum Rating	Full Vacuum
Temperature Rating	-90°F. to 400°F.

<sup>†</sup>DuPont Tetrafluoroethylene Resin. \*Only virgin Teflon is white. \*\*Patent Pending.

*John L. Dore, Co.*

SALES AGENTS IN U.S.A.  
FOR JOHN L. DORE, INC.  
Du Pont's Teflon • Hi-Quality Nylon

5406 SCHULER • P. O. BOX 7772 • HOUSTON 7, TEXAS

Check 1814 opposite last page.

## **NEW SOLUTIONS** of processing problems



Atomizing nozzle disperses counteractant into gas stream from ammonium sulfate process. Counteractant system has stopped odors and ended complaints from neighboring residential area

Desire on part of Koppers Co. to help in fight against air pollution, led to investigation of ways to end odor problem in ammonium sulfate process. Result was an odor counteractant system that . . .

## **ends odor nuisance at low cost**

**Problem:** Odors from ammonium sulfate production at Koppers Co., St. Paul, Minn., were source of complaints from surrounding residential sections. Increasing importance of eliminating these odors, and others emanating from coking operations and by products manufacture, was recognized by Koppers' man-

agement in their desire to assist local air pollution control agencies.

A cooling tower was installed for sulfate process and exhaust gas passed through it. Although tower performed in its initial capacity to cool process water, hoped for odor elimination was not achieved.

**Solution:** During summer of



Air gun draws liquid counteractant from drum on right by siphon action. Once proper balance is obtained no additional maintenance is required. Setup eliminates odors from cooling water sump in by-products plant

1955 Koppers evaluated a system of odor counteraction. Tests were performed in which plant officials toured neighboring areas to note odor conditions both with and without system in operation. On basis of these tests a permanent installation was made on ammonium sulfate cooling tower exhaust stack.

Liquid odor counteractant is vaporized into gas stream by means of a spray gun with a calibrated atomizing nozzle. Compressed air at 40 psi draws liquid counteractant to nozzle by siphon action from pressure drum stored in a convenient location. About 2 cfm of air pass through nozzle.

Counteractant mixes with odorous air stream by molecular dispersion and air movements. It is formulated to follow physical behavior pattern of odorous elements. In this way counteractant is effective until odor is dispersed beyond range of perceptibility.

Equipment for odor control was installed without any changes in process equipment and no downtime. Operation is automatic.

Once installation is set up and balanced, only maintenance is weekly filling of pressure containers.

**Results:** Complaints on plant odors have been virtually eliminated. Koppers has been able to successfully solve their odor problem with very little initial equipment cost and negligible space requirements. Installation of this equipment on effluent gases from cooling water sump in by-products department, achieved similar satisfactory results. Material cost per day for 24-hr operation has been running approximately \$9.80.

(Odor counteractant system was supplied by Industrial Odor Div., Airkem, Inc., 241 E. 44th St., New York 17, N.Y.)

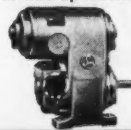
Check 1815 opposite last page.

## THE RIGHT ANSWER

for greater productivity from machinery investments



Sterling Speed-Trol Variable Speed Motors



Sterling Slo-Speed Gear Motors



Sterling Constant Normal Speed Motors



Sterling Multi-Mount Speed Reducers



## Sterling

ELECTRIC POWER DRIVES

The important distinguishing features of Sterling Electric Power Drives can bring greater productivity and cost reductions to your manufacturing operations. To help you meet the competitive challenge of mechanization and automation, Sterling offers you a three-fold answer: Power transmission equipment, variable speed or constant speed—manual or automatic controls—and an application engineering service. Together, these give your machinery the type of drive systems that will achieve maximum productivity at lowest cost.

Write today for Bulletin No. 185. Discover the big advantages Sterling Electric Power Drives can bring to your plant.



## STERLING

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Los Angeles 22 • Chicago 35 • Cincinnati 37 • New York 51

Check 1816 opposite last page.



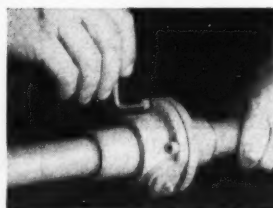
## NEW CHIKSAN DISCPAK SWIVEL JOINTS

### FOR STEAM AND HOT GAS SERVICE

Created specifically for service on lines employed in steam and hot gas service, the Chiksan Discpak embodies a new construction design which permits packing units to be replaced without removing the joint from the line. The outer housing of the Discpak is cut apart at the packing chamber and both ends are flanged at the cut. Four allen-type cap screw bolts are used to secure the flanges. A disc-seal, housed between the two members, provides a fluid-tight seal between rotating and stationary members of the Discpak Swivel Joint. A spring loaded pressure plate holds the packing in sealing position against the swiveling member.

The new Discpak has a maximum temperature rating of 600° F. and a maximum pressure rating of 300 psi. All turning movement in the Discpak takes place on a double row of precision ball bearings. Write today for literature and prices. If your plant or equipment lines utilize hot gas or steam, it will pay you to know about this new field-proven Discpak swivel joint.

**REPLACE SEALS  
WITHOUT REMOVING JOINT  
FROM THE LINE**



To replace the disc-seal, simply remove four allen screws and spread line slightly with a flat metal bar.

# CHIKSAN



CHIKSAN COMPANY, 330 No. Pomona Avenue, Brea, California  
A SUBSIDIARY OF FOOD MACHINERY AND CHEMICAL CORPORATION

Please rush me a copy of your new Discpak Bulletin



NAME \_\_\_\_\_  
COMPANY \_\_\_\_\_ TITLE \_\_\_\_\_  
CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_  
DEPT. 1711

CHIKSAN DISCPAK  
SWIVEL JOINTS



### SEND FOR BULLETIN

New Discpak Bulletin 100 describes in detail the many features of this new swivel joint including full mechanical specifications.

57-26

### NEW SOLUTIONS

#### Overcome gummy clogging in mixing operation at Armour

Carbon-steel batch blender cuts maintenance, downtime

**Problem:** Gummy condition in dry blending of synthetic detergent formulations at Armour & Company Auxiliaries, Chicago, Ill., tended to clog up and impair operation of conventional mixing units.

In soap and detergent industry, careful formulation and blending of materials is of prime concern. Improper, uneven mixing of alkaline builders, for example, can detract from an even blend as well as interfere with proper operation of equipment.

**Solution:** After checking performance records at other industrial plants, Armour and Company decided to install a 3000-lb capacity carbon-steel rotary batch blender.

Ingredients for heavy, industrial synthetic detergents, after careful formulation in weighing, undergo four-way mixing action in blender. As materials enter unit, they are snatched up by revolving scoops and carried to top of mixing chamber. Here, they are cascaded into chamber and mixed by revolving action.

Detergent powders are forced from both ends to the middle of the drum. Both intake and discharge are at same



"My back itches..."

CHEMICAL PROCESSING

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## NEW SOLUTIONS

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end of unit and materials can be charged and/or discharged during mixing cycle if desired. Changing formulations pose no problem. Unit can handle less than 3000 lb with equal efficiency.

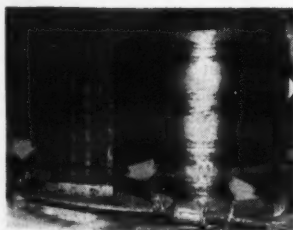
**Results:** Since 1955, the rotary batch blender has been successfully blending synthetic detergents. Up to 1½ tons per batch are handled with negligible amount of maintenance. Only minimum downtime for cleaning (about one hour) is required because of easy accessibility to unit.

(Carbon-steel rotary batch blender is product of Sturtevant Mill Co., 103 Clayton St., Dorchester, Boston 22, Mass.) Check 1818 opposite last page.

### PVC valves cut costs, handle corrosives successfully

Halby Chemical eliminates high maintenance

**Problem:** Cost of maintenance and repairs on metallic valves handling thioglycolates and thiocyanates at Halby Chemical Co., Wilmington, Del., was becoming prohibitive. Sticking was frequent and corrosion severe. A number of different metals were tried without success.

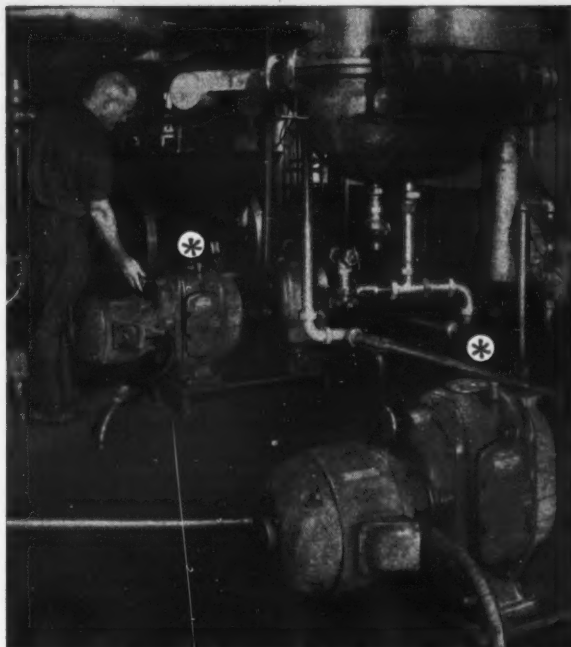


PVC valves (arrows) have eliminated high maintenance costs in handling thioglycolates and thiocyanates at 104°F

Valves are opened and closed frequently, and are usually operated in throttling position. Temperatures of solutions range from 50 to 104°F.

**Solution:** Halby, early in 1955, placed in service all-molded valves of unplasticized

## Pure milk to pungent ammonia...



Providing stepless, instantly variable control of circulating pump speeds on this milk condensing system, Link-Belt P.I.V. drives provide extreme accuracy at all settings.



P.I.V. drives on high-pressure pumps handle ammonia in a midwest caustic purification plant. Of all-metal construction, P.I.V. offers resistance to corrosive atmospheres.

## IT'S P.I.V. for instant variation through a complete range of positive speeds

*Stepless, non-slip — operates independent of friction*

**V**ARIABLE for any speed, positive at all of them—Link-Belt P.I.V. accurately delivers required horsepower from maximum to minimum settings. Turn a hand-wheel ... push a button ... or utilize fully automatic controls. The self-pitching chain drive will engage radial-grooved conical wheels at the exact diameters required for precise output-speed delivery.

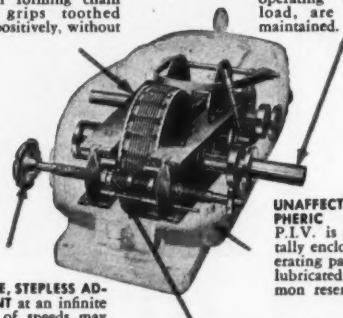
This positive chain drive—independent of friction—accounts for the unmatched accuracy of P.I.V. at all loads. Moreover, that efficiency is maintained throughout extended service life.

Your nearest Link-Belt office or authorized stock-carrying distributor will assist your selection from 8 sizes and 16 types. You can also get full data by writing for Book 2274.

**LINK-BELT**  
P.I.V. VARIABLE SPEED DRIVE

**SPEED YOU NEED** at any setting is provided by self-tooth forming chain which grips toothed wheels positively, without slip.

**MINUTE SPEED CHANGES**, even while operating under full load, are accurately maintained.



**POSITIVE, STEPLESS ADJUSTMENT** at an infinite number of speeds may be made through manual (shown), electric, pneumatic or hydraulic controls.

**EASY-VIEW SPEED SETTING INDICATOR** facilitates speed selection and adjustments to meet all requirements.

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office: New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.

14,978

Check 1819 opposite last page.

**FOR CORROSIVE OR  
COSTLY FLUIDS OR GASES  
GET THE FACTS ON  
CHEMLON®  
PACKINGS**

**...acids, alkalis,  
solvents, toxics,  
food products  
up to 600°F.**

**FABRICATED  
FROM DUPONT  
TEFLON**

**JOHN CRANE'S** line of Chemlon Packing offers an unlimited selection of types, shapes and sizes for practically every service requirement:

- ..... types best suited for valves and automatic regulators.
- ..... for high or low-speed centrifugal, rotary or reciprocating pumps.
- ..... for agitators and mixers.

Here in one bulletin is illustrated and described industry's most complete line of chemically inert packings. You'll save time, trouble and expense on fluid or gas handling problems by requesting Bulletin P-325.

Crane Packing Company, 6421 Oakton Street, Morton Grove, Illinois (Chicago Suburb). In Canada: Crane Packing Co., Ltd., Hamilton, Ont.



Check 1820 opposite last page.

## NEW SOLUTIONS

polyvinyl chloride. Units have built-in gland with self-lubricating Teflon packing. Bonnet includes back-seating surfaces for easy repacking under full pressure. Valves are rated at 125 psi water pressure and at 140°F.

**Results:** Maintenance and replacement due to corrosion and sticking has been stopped. For over two years, units with PVC valves have been giving trouble-free service.

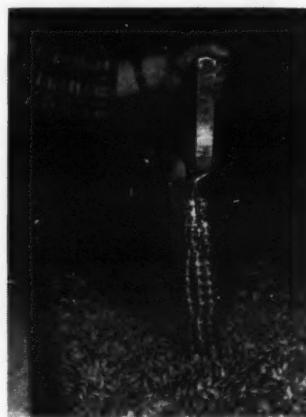
(Luncor PVC valves are product of The Lunkenheimer Co., Cincinnati, Ohio.)

Check 1821 opposite last page.

**Corrosion, safety problems  
practically eliminated  
in plating room**

**Expanded, polyethylene  
floats are puncture-proof**

**Problem:** Vapors from solution of chromic acid in aluminum anodizing tanks and from chromic-sulfuric acid solution in chrome plating tank were creating potential hazard to personnel and cor-

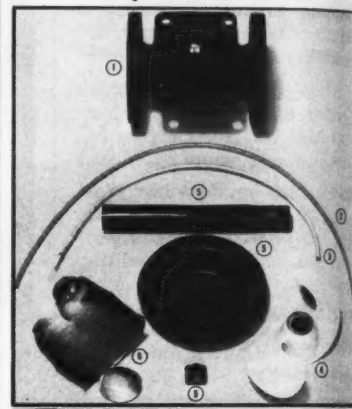


Polyethylene floats stop vapor loss from plating tank

roding exposed surfaces of exhaust system and overhanging pipe at Grimes Manufacturing Co., Urbana, Ohio. Evaporation losses, due to extensive exhaust system, were considerable.

Attempts to cover solution surfaces with small, hollow,

## SUCCESS STORY POLYFLUORON by ACME



### SUCCESSFUL APPLICATIONS OF POLYFLUORON

1. Saunders Diaphragm Type Valve
2. Fiber-Glass Sleeving
3. Fiber Glass-Jacketed Co-Axial Cable
4. Outboard Aluminum Propeller (700 hrs. immersion in Salt Water)
5. Top—Segment plating bath heat Exchanger Center—Test Pan Contained Acetic Acid—For 9 Mo. at 120° F. Bottom — Radio Frequency Connector Housing.
6. Aerosol-Container After 9 Mo. Pack with Sodium Lauryl Sulfate at 105° F.

During the last four years the Liquidometer Corporation of Long Island City, New York has used Amphenol Electronic's, Chicago, Illinois, POLYFLUORON coated coaxial cables for the interconnecting wiring of fuel sensing tank units and gauges. These units are Liquidometer type capacitance gauges used to measure fuel on military fighter aircraft. POLYFLUORON has withstood the active solvents found in aviation fuels. Many thousand successful installations have been made of these units.

POLYFLUORON has solved successfully many problems using one or more of its properties.

- Organic Solvent resistant • Unaffected by acids or alkalis • Zero moisture absorption
- High temperature stability • Excellent electrical properties

Send for complete information on the utilization of POLYFLUORON properties from dispersion coating systems, from extruding materials and from molding powders.

A POLYFLUORON dispersion is available in an aerosol dispenser. The dispenser with container of a Primer is available at \$4.00. Remittance should accompany your order.

**ACME  
RESIN CORPORATION**  
1401 CIRCLE AVE. / FOREST PARK  
(A Suburb of Chicago)

Check 1822 opposite last page.

CHEMICAL PROCESSING



## NEW SOLUTIONS

heat-sealed polystyrene tube proved impractical. Aging caused tubes to crack, lose their buoyancy, and sink to bottom of tank.

When tanks were drained, splinters of tube would clog and obstruct drain pipes, causing extensive down-time for pipe maintenance.

**Solution:** Star-shaped, puncture-proof polyethylene floats were used to cover solutions. Floats have uni-cellular construction. Layer of floats 2" thick was used to cover 282 gal of chromic acid in anodizing tank. In chrome plating tank holding 82 gal, 1" layer was used.

**Results:** Use of polyethylene floats has practically eliminated pipe maintenance difficulties, major corrosion problems, and safety hazards. There is no discoloration of equipment or walls in plating department from solution vapors.

No replacements have been necessary on pipes or fans in exhaust system. Floats show no tendency to cling to parts when parts are removed from tanks.

("Mini-vaps" are product of American Agile Corp., 5461 Dunham Rd., Maple Heights, Ohio.)

Check 1823 opposite last page.

### Leakage cut over 200% by new tray gasketing in still column

Made of asbestos fiber and knitted Monel wire

**Problem:** High leakage across fractionating trays was being experienced at a large East Coast refinery. After one year's run, leakage was often as high as 370% above allowable, with serious effects on production and product quality. Even after re-gasketing, leakage tests were often 20 to 30% above allowable.

**Examination** of trays showed excessive localized leakage at joints between tray sections and around tray circumference. Conventional asbestos-cotton tape gasketing

Monday, December 2nd, The Sharples Corporation will introduce to the chemical and process industries three completely new centrifuges that have been designed specifically for operation at high pressures and at high throughput capacities. In addition, there will be a demonstration of dry powder densification equipment.

AT 12:01

## The SHARPLES CORPORATION • Booth 485



RELAX • ride the escalator right to Booth 485 — 2nd fl. at the Chem Show — New York Coliseum

Check 1824 opposite last page.



## ***SNAP\*ON makes a measurable difference in heat loss...and initial cost...***

... because this one-piece pipe insulation molded of fine glass fibers has no equal in thermal efficiency for cold and heated piping and no equal for low applied costs.

With Snap\*On you can actually measure the difference in ...

1. **Lower operating costs** due to greater insulating efficiency.
2. **Lower material cost** because less wall thickness is required to do an equal or better thermal insulation job than other pipe insulations.
3. **Labor savings** in installation range from 10 to 50% compared to other insulations.

One-piece sections of Snap\*On are also light weight, won't break and they snap on the pipe with one easy step. Available in single cylinders with one seam for all pipe sizes to 33", plain, for field application of jacket, or with factory applied canvas, vapor barrier or weatherproofing jackets.

Let one of our sales engineers make a *Thermo-Economic Value Analysis* of your next job to show how Snap\*On will make a "measurable" difference in initial investment and operating costs. Write today.

# **GUSTIN-BACON**

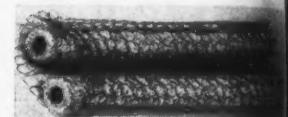
*Manufacturing Company* **gb**  
BACON

Thermal and acoustical insulations • Molded glass fiber pipe insulation  
Pipe couplings and fittings  
254 W. 10th St., Kansas City, Mo.

## **NEW SOLUTIONS**

would not stand up. Not only did it lose its resiliency, but the cotton became charred away, leaving open spaces along joints.

**Solution:** It was decided to try a new gasketing made of pure asbestos fiber and knitted Monel wire. Tray No. 28 of a 9-ft ID atmospheric tower in a crude oil pipe still was



Dumbbell-type gasketing is designed for sealing joints between tray sections. Tray bolts are pushed through sheath as gasketing is laid in place. Flat-type gasketing is also available for sealing circumference of trays at support ring

selected for the first installation. Operating temperature was about 200°F, under highly corrosive conditions.

**Results:** When gasketing was first installed, leakage tests showed 6% under allowable, with no localized leakage. At end of year's run, total tray leakage had risen to only 67% above allowable, compared to 370% previously experienced. Examination during tests showed that only 20 to 25% of this was traceable to the gasketed joints.

Tray seal showed no charring, was still resilient and did not need to be replaced. Tightening of a few of the section bolts was only attention required. As a result of test, the gasketing was installed on all 29 trays within the tower.

In addition, it was also installed on tray No. 8 in an 18½-ft ID vacuum tower. Here temperatures ranged from 730 to 750°F. Tests at start of run showed total tray leakage 19% below allowable.

Although new gasketing is more expensive than conventional type, experience to date has demonstrated that results, plus easier and quicker installation, more than justify its cost.

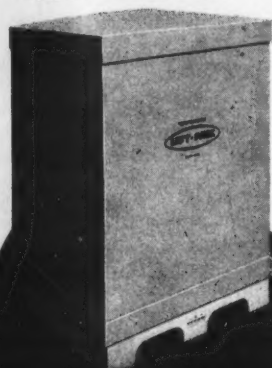
(Metex Tray Seal is product of Metal Textile Corp., Roselle, N. J.)

Check 1826 opposite last page.

Check 1825 opposite last page.

# TITAN\*

## EXPENDABLE LIFT • PACK



**PALLETIZED  
SHIPPING CONTAINERS  
FOR  
BULK and GRANULAR  
PRODUCTS**

**STRONG** — up to one ton capacity; stacks two high for efficient storage and shipments.

**ECONOMICAL** — eliminates cost of bags, filling, sealing, separate pallets, labor in loading and unloading. No repairs.

**SPACE SAVING** — shipped and stored knocked down, set up as needed in 1½ minutes.

**SANITARY** — clean surfaces throughout. Liners can be used for hydroscopic or highly purified products.

**SIZES** — tailored to your specific needs. Sizes governed by your facilities, load requirements, and product unit density.

**LIGHT-WEIGHT** — unique engineering makes low tare-weight possible, for real shipping saving.

**EXPENDABLE** — TITAN LIFT • PACK builds good will with clean new units. No returns, capital tie up, control, or hidden costs. Rectangular for efficient use of shipping and storage space and for easier loading. Can be imprinted on flat sides and cap as desired. These and many other features distinguish Titan's Palletized Lift • Pack.

### TITAN EXPENDABLE TRAY PALLETS.

Engineered for patterned loads up to 2000 lbs. on forks; stacks four high. Weighs under 10 lbs. Shipped and stored K. D. for space economy. Rigid deck provides security for load and easy maneuvering.

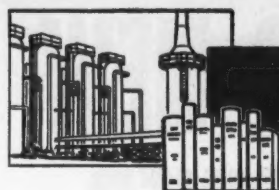
For more details, write

## TITAN\*

TITAN PALLET CO., INC.  
342 Madison Avenue, New York 17, N. Y.

\*Titan carries the load.

TM Reg. Pats. Pend.



# processing and engineering data

## HOW TO MAKE NOMOGRAPHS — III

### Addition and Subtraction Charts, Concurrent Scales

D. S. DAVIS

Head, Department of  
Pulp and Paper Technology  
University of Alabama

**Ed. Note** — This is the third installment in the continuing series on "How to Make Nomographs", by CP's consulting editor, Dr. D. S. Davis. The series began with the August issue, and second installment appeared in October. Whole series will contain six installments and will be running in consecutive issues from this issue through the February issue.

In October we saw that simple addition and subtraction could be handled readily with parallel scales. Some important equations in the fields of heat transfer, electricity, and optics involve the sums or differences of reciprocals. In such instances three concurrent axes that make successive angles of 60° and that bear uniform scales of the same moduli are convenient. A straight line will cut such scales in values that satisfy the equation.

Let's consider the heat transfer expression

$$\frac{1}{H} = \frac{1}{h_w} + \frac{1}{h_g}$$

where  $H$  = combined film coefficient, 100 to 500 Btu/(hr)(sq ft) (°F)

$h_w$  = water film coefficient, 100 to 700 Btu/(hr)(sq ft) (°F)

$h_g$  = gas film coefficient, 400 to 1000 Btu/(hr)(sq ft) (°F)

Draw three concurrent axes at successive angles of 60° as shown in Figure 3

on page 93. Choose a common modulus of 0.015 cm, use any good centimeter scale or the natural scale on the modulus chart that appeared previously<sup>2</sup>, and from the apex lay off uniform scales on each axis. Note that an interval of 20 in  $h_w$ ,  $H$ , and  $h_g$  corresponds to 0.3 cm and that the graduated portions of the  $h_w$ ,  $H$ , and  $h_g$  scales have respective lengths of 0.015 (700 — 100) or 9 cm, 0.015 (500 — 100) or 6 cm, and 0.015 (1000 — 400) or 9 cm.

For a more complete treatment, fortified with underlying theory, of addition and subtraction charts with concurrent scales, see one of the texts<sup>1</sup>.

Next month we'll discuss multiplication and division charts with parallel logarithmic scales.

### LITERATURE CITED

- 1) DAVIS, D. S., "Nomography and Empirical Equations," pages 146-148. Reinhold Publishing Corporation, New York, 1955.
- 2) DAVIS, D. S., CHEMICAL PROCESSING, 20 (8) 71, 73 (1957).



**"WEIR-FLOW"**  
for medium-to-high liquid rates

The development of newer tower packings (such as Intalox Saddles and Metal Pall Rings) brought into sharp relief the need for better liquid distributors to permit full utilization of the better performance characteristics of these packings.

U. S. Stoneware developed, pilot-plant and field-tested, a number of distributors. Two, in particular, showed far superior operating characteristics, and are now offered as standard items in our line.

**The "WEIR-FLOW" Distributor:** Cylindrical risers with "V" notches are used as downcomers for the liquid, permitting greater flow as the head increases. Provides uniform liquid distribution over a wide range of medium to high liquid rates. Made in chemical stoneware and chemical porcelain in a range of sizes to fit towers up to 8 feet in diameter; also in carbon steel or stainless steel for towers as small as 6" i.d., and in larger diameters to fit customer's specifications.

# TWO NEW TOWER DISTRIBUTORS

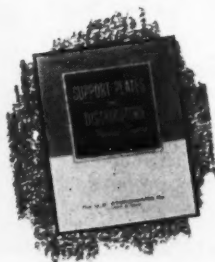


**"MULTI-LEVEL"**  
for low-to-medium liquid rates

**The "MULTI-LEVEL" Distributor:** Essentially a tray with a perforated bottom, but the perforations drain at three different levels. Provides uniform liquid distribution over a wide range of low to medium liquid rates. Made in chemical stoneware and in chemical porcelain for towers from 24" to 60" in diameter.

SEE THEM AT THE CHEM SHOW, NEW YORK COLISEUM, DECEMBER 2-6, BOOTH 111

102-F



## New Booklet on SUPPORT PLATES and DISTRIBUTORS

New 24 page booklet just off the press describes our complete line of support plates and distributors. Write for it today. Ask for Bulletin TA-30.

**U. S. STONWARE**  
AKRON 9, OHIO

Check 1828 opposite last page.



## NEW SOLUTIONS

### Spray drying facilities on rental basis

Processors whose production or product nature may not justify installation of commercial-size spray drying unit, can take advantage of drying facilities offered on rental basis. Manufacturers also makes pilot and intermediate-size drying units for installation in processing plants of all sizes.

(Spray drying facilities are offered by Instant Drying Corp., 101 Park Ave., New York 17, N.Y.)

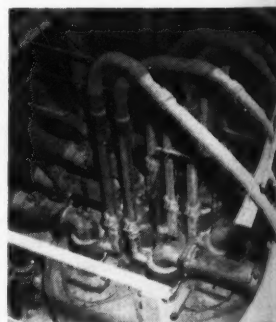
Check 1829 opposite last page.

### High-efficiency heater prevents contamination, cuts maintenance . . .

Used to heat anhydrous sodium nitrate at Olin Mathieson

**Problem:** When a new combustion chamber was to be installed to heat a recirculating stream of molten anhydrous sodium nitrate at Olin Mathieson's Lake Charles, La. plant, engineers wanted a design that was both compact and efficient.

They were also interested in getting a unit that did not



Eight burners fire downward in compact configuration in small-volume combustion chamber

use refractory brickwork, since entrained particles in the recirculating stream had a tendency to etch out the brickwork, necessitating costly repairs and creating problems with product contamination.

To page 90



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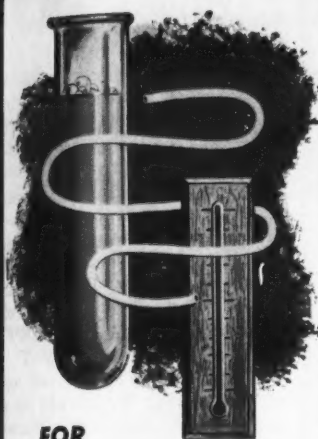


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To page 94

CESSING



**FOR**  
**HIGH TEMPERATURES**  
**CORROSIVE STREAMS**  
**FLEXIBLE APPLICATIONS**

USE



**FLEXIBLE**  
**TUBING**

MADE FROM

**TEFLON\***

A unique combination of properties are available to you when you use PF flexible tubing made from Teflon\*:

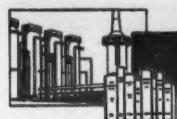
- widest service temperature of any plastic (-450°F to +500°F)
- complete chemical inertness
- flexibility and toughness even at the temperature of liquid oxygen.
- lowest coefficient of friction of any solid material
- very low permeability
- available with flare, insert and ferrule type fittings

These properties, plus our carefully controlled extrusion techniques, make PF's flexible tubing made from Teflon\* ideally suited for chemical, pharmaceutical, petroleum, hydraulic hose and similar applications requiring unique tubing properties.

Write, wire or call for information on special sizes, wall thicknesses and colors and for PF heavy wall tubing, spaghetti and rod stock.

**PENNSYLVANIA FLUOROCARBON CO., INC.**  
1713 N. 38th Street, Phila. 4, Pa. EVergreen 6-0603

CUT HERE AND FILL



processing and engineering data

### How to Make Nomographs — III From page 91

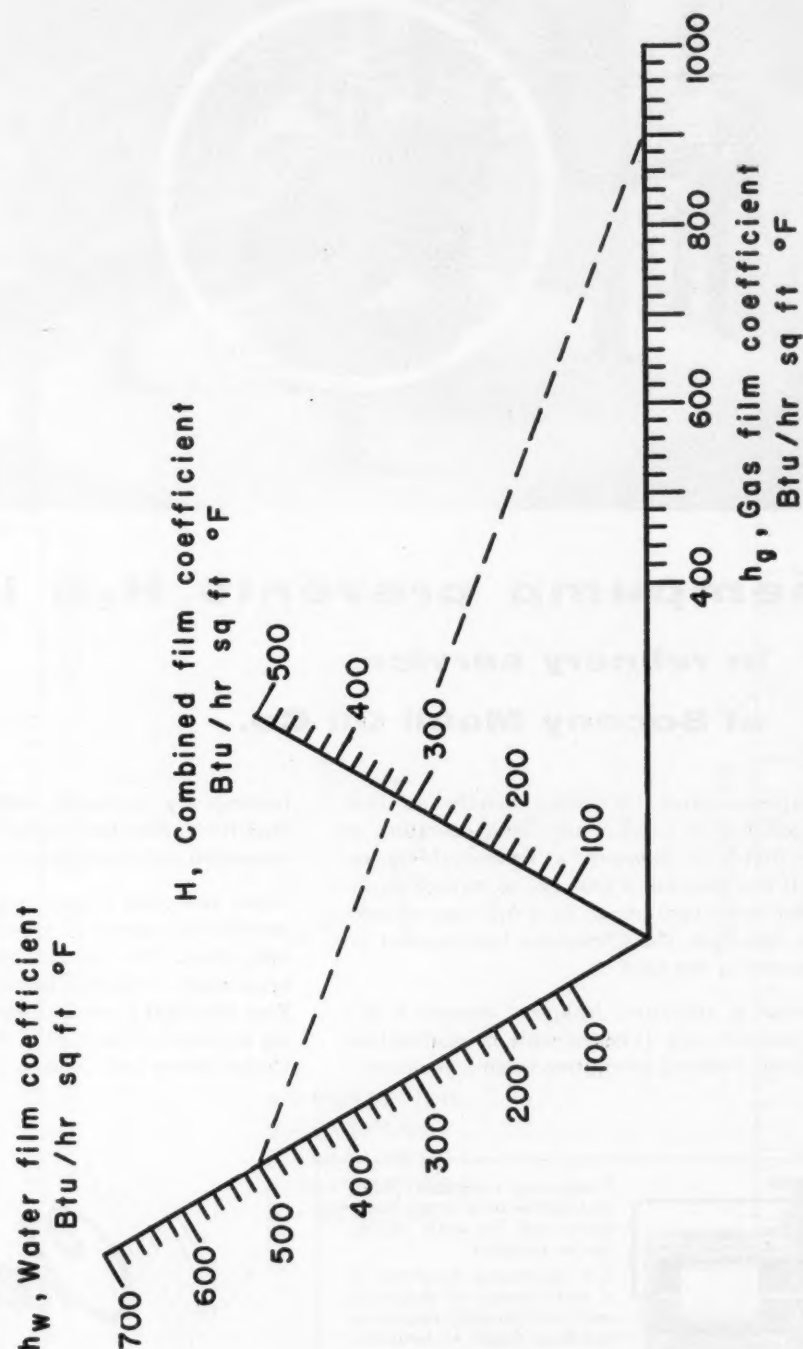
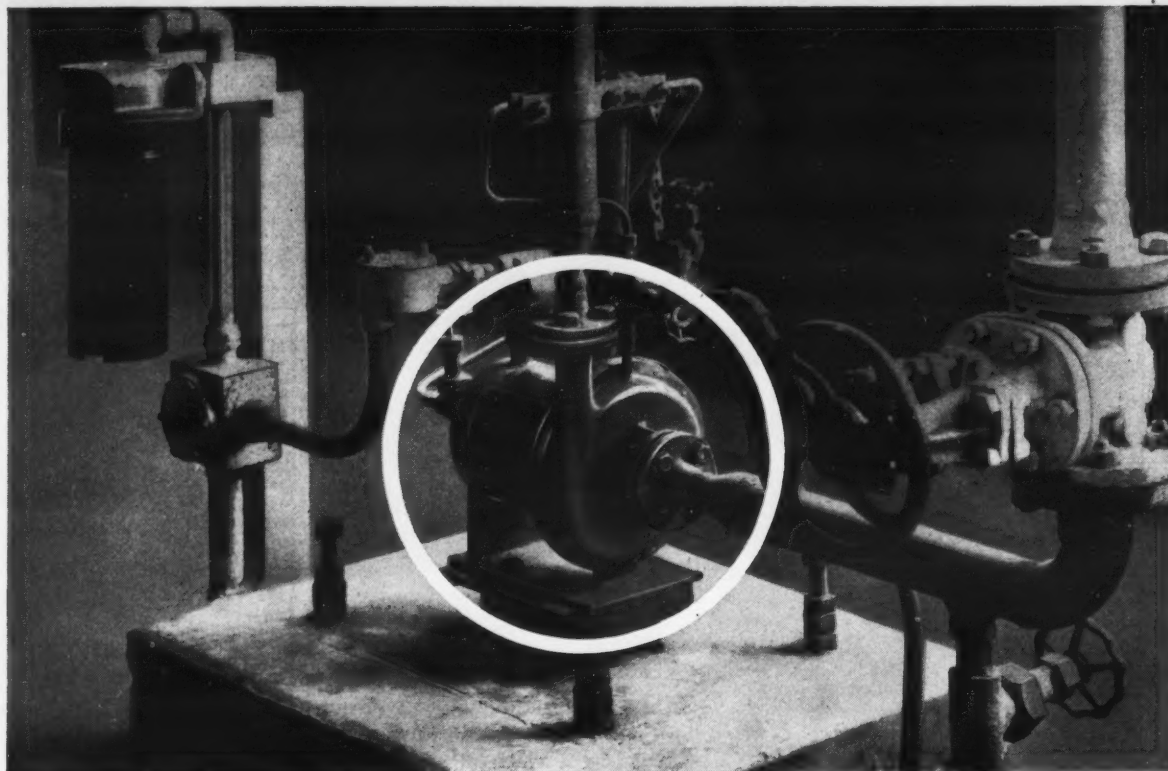


Fig. 3



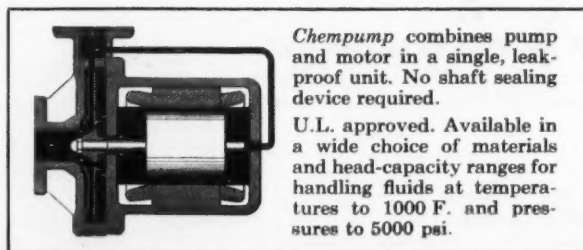
## Chempump prevents H<sub>2</sub>S leakage in refinery service at Socony Mobil Oil Co.

This explosion-proof *Chempump* handles an H<sub>2</sub>S water solution in a DEA scrubbing operation at Socony Mobil Oil Company's Trenton, Mich. refinery. It was installed a year ago to replace a conventional centrifugal pump. In a full year of zero-leakage operation, the *Chempump* has required no maintenance of any kind.

*Chempump* is absolutely leakproof because it is a totally enclosed unit. It has no seals, no stuffing box, no packing. External lubrication is never required—

bearings are constantly lubricated by the pumped fluid itself. Maintenance is limited to an occasional inspection and replacement of bearings.

These and other *Chempump* advantages could well provide the answer to a pumping problem in your own plant. For details concerning your specific application, write to Chempump Corporation, 1300 East Mermaid Lane, Philadelphia 18, Pa. Engineering representatives in over 30 principal cities in the United States and Canada.



*Chempump* combines pump and motor in a single, leak-proof unit. No shaft sealing device required.

U.L. approved. Available in a wide choice of materials and head-capacity ranges for handling fluids at temperatures to 1000 F. and pressures to 5000 psi.

*Chempump*

First in the field...process proved

Check 1831 opposite last page.

## NEW SOLUTIONS

From page 92

**Solution:** Company installed a compact direct-fired heater that uses a total of eight high-velocity gas burners. Unit is constructed of Stainless Steel and does not require use of firebrick. Burners operate on natural gas supplying total heat input of about 45 million Btu/hr. Air is recycled. Temperature of incoming air is above 500°F. leaving in excess of 1000°F.

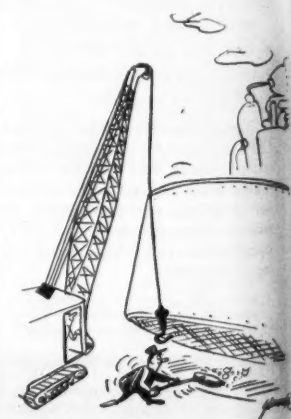
Burners are located at top of unit, firing downward in a compact configuration. Burners are spark-ignited with high-voltage spark plugs. Special "Fireye" control system (lead sulfide scanner cell) was installed on each burner to obtain control and safety without interference in the close configuration.

**Results:** Use of small-volume combustion chamber results in the production of quality anhydrous sodium nitrate free of contamination by brickwork and very low in water insolubles. Fuel consumption for unit is relatively low.

The safety and "push button" features of the heating system have received high operator acceptance. Stainless steel construction has simplified maintenance.

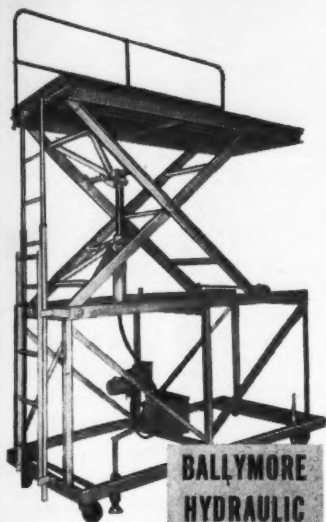
(Air heater was produced by Thermal Research and Engineering Corporation, Conshohocken, Pa.)

Check 1832 opposite last page.



CHEMICAL PROCESSING

## A NEW METHOD FOR WORKING AT HIGH LEVELS SAFELY...



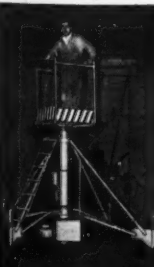
**BALLYMORE  
HYDRAULIC  
LIFT  
WORK  
PLATFORMS**

Production and maintenance jobs are made easier, quicker and safer when you use Ballymore Hydraulic Lift Work Platforms. They provide a large, firm working area between 7 and 20 feet from the floor and can be used indoors or out.

Sturdily constructed of steel and mounted on ball-bearing casters... can accommodate up to 3 men. Leveling jacks at each corner assure complete stability.

Hydraulic power raises the formed expanded steel platform to any height up to 15 feet. Double rack and pawl hold the platform at the desired working level.

For complete information, write to the Ballymore Company, West Chester 10, Pa.



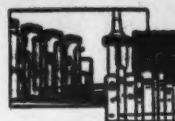
### MOBILE ACCESS LIFTS...

For working levels up to 40 feet above ground level. Easily positioned, quickly elevated, safe. May be collapsed for mobility through restricted openings. Invaluable for a variety of jobs. Write for details.

LOOK FOR THIS LABEL

TO BE SURE  
IT'S THE BEST!

BALLYMORE COMPANY  
WEST CHESTER PA



## processing and engineering data

217

## Solubility of Water in Hydrocarbons

WILLIAM RESNICK  
Park Forest, Illinois

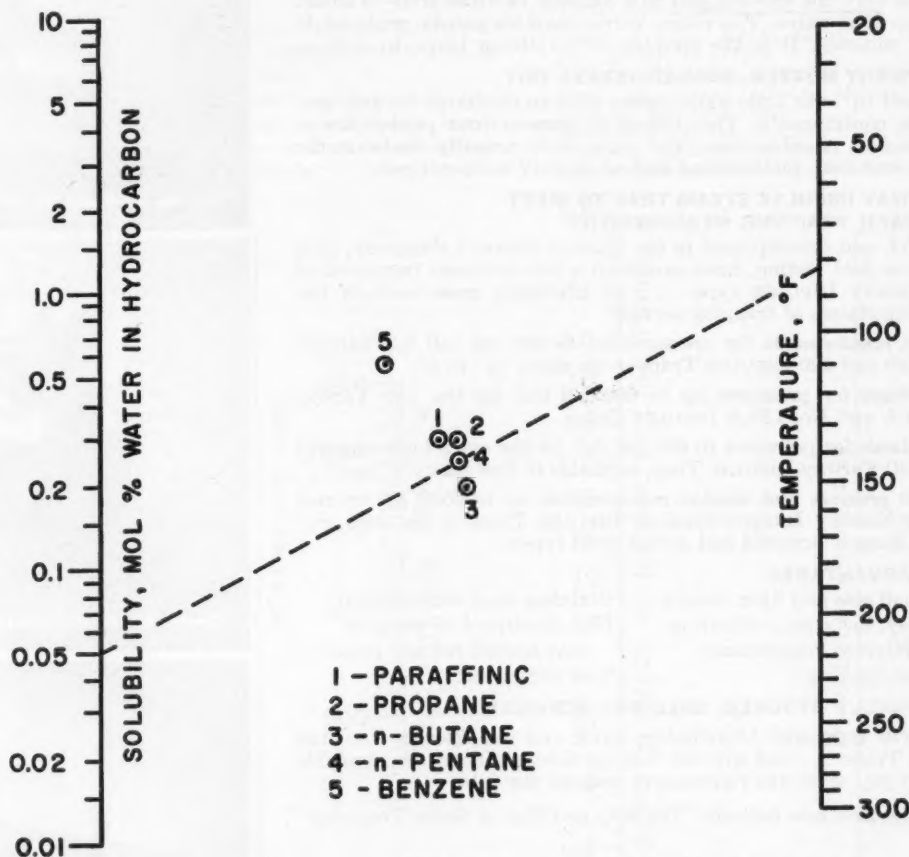
This nomograph enables one to estimate the molal solubility of water in many hydrocarbons. It is based on experimental data<sup>1</sup>. In use, a straight line is drawn between the temperature and the appropriate numbered point and is then extended to the solubility scale.

### TYPICAL EXAMPLE

The dotted line shows that the solubility of water in n-pentane at 82°F is 0.05 mol percent. Point 1-Paraffinic can be used for gasoline, kerosene, naphtha, and lube oils; point 5-Benzene can also be used for other aromatics.

### LITERATURE CITED

1) AMERO, R. C. and MOORE, J. W., *Chem. Eng. Prog.*, 43, 349-370 (1947).





# The Yarway Impulse started a new era in steam trapping...

...it began in 1935, when Yarway applied a unique principle of thermodynamics to steam traps—and the Yarway IMPULSE Steam Trap was born.

Since then over 1,225,000 Yarway IMPULSE traps have proved themselves so well in service that today many other type traps are regarded as obsolete—an understandable reason why the Yarway IMPULSE type of steam trap is being imitated.

To industry, the Yarway IMPULSE trap makes possible a new high in thermal efficiency of equipment, a new low in trap operating maintenance...resulting in increased production and higher profits.

## THE THERMODYNAMIC PRINCIPLE

This is the principle on which the Yarway IMPULSE trap design is based—that variations in temperature of water discharging through two orifices in series cause variations in pressure in an intermediate chamber between the orifices, and that these changes in pressure may be utilized to open and close the trap valve.

## ONE MOVING PART

There is only one moving part in a Yarway IMPULSE trap—a small, stainless steel valve. The entire valve assembly can be replaced in 5 or 6 minutes. It is the simplest of all steam traps to service.

## EQUIPMENT HOTTER, SOONER—STAYS HOT

At "start up" the little valve opens wide to discharge air and condensate continuously. This brings equipment into production in the quickest possible time. The valve then actually floats on the condensate load, maintaining highest, steady temperatures.

## A YARWAY IMPULSE STEAM TRAP TO MEET EACH TRAPPING REQUIREMENT

Research and development in the Yarway Steam Laboratory, plus intensive field testing, have produced a line of steam traps—all of the Yarway IMPULSE type...to efficiently meet each of the following classes of trapping service:

**Normal requirements** for pressures up to 600 psi call for Yarway Series 60 and 120 IMPULSE Traps in six sizes, 1/2" to 2".

**Light loads** for pressures up to 600 psi call for the 1/2" Yarway No. 20-A and No. 120-A IMPULSE Traps.

**Heavy loads** for pressures to 600 psi call for the extra high capacity Series 40 Yarway IMPULSE Trap, available in five sizes, 1/2" to 2 1/2".

**Highest pressure and marine requirements** up to 2500 psi are met by the Yarway Integral-Strainer IMPULSE Trap, in six sizes, 1/2" to 2", flanged, screwed and socket weld types.

## PLUS ADVANTAGES

- Small size and light weight
- Stainless steel construction
- Easy, low cost installation
- No adjustment of valve or seat needed for any pressure
- Minimum maintenance
- Low initial cost
- Non-freezing

## NATIONALLY STOCKED, SOLD AND SERVICED

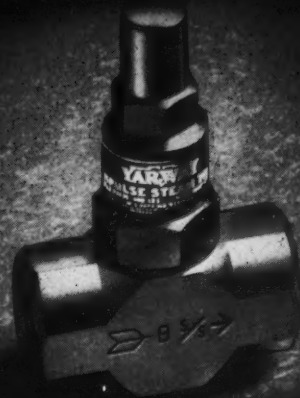
Over 270 Industrial Distributors stock and sell Yarway IMPULSE Steam Traps...and over 35 Yarway field engineers are available to help you select the right steam trap for the job.

Write for free, new bulletin "The Why and How of Steam Trapping."

YARNALL-WARING COMPANY  
125 Mermaid Avenue, Philadelphia 18, Pa.

**YARWAY** impulse®

...a good way to specify steam traps



Series 60 and 120 for normal requirements.



1/2" No. 20-A and No. 120-A for very light loads.



Series 40 for very heavy loads.



Integral Strainer Impulse Traps for highest pressures and marine use.

For more information on product at left, specify 1834 see information request blank opposite last page.



Clip to

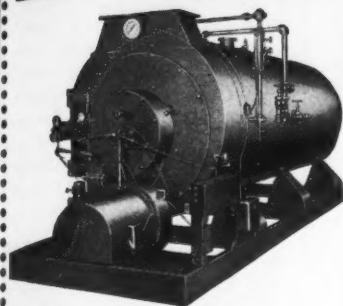
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# CYCLOTHERM...

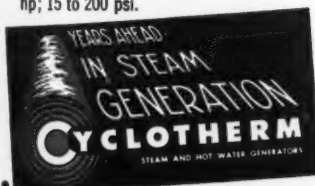
EASY to INSTALL  
ECONOMICAL to OPERATE



**Low-cost steam.** You'll get a new idea of low-cost steam production when you install a Cyclotherm Steam and Hot Water Generator. It requires no costly stack—operates with a simple flue. It needs no special foundation or excavation. And since the Cyclotherm is up to one-third smaller than other package steam generators, it fits into the smallest possible boiler room space. Can be easily relocated in time of expansion.

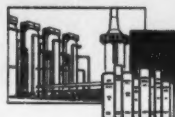
**Low operating costs.** One maintenance man can take care of a Cyclotherm—parts are easy to get at, easy to clean. Burns gas and/or oil, with a quick changeover to whichever fuel is cheaper. Automatic controls save fuel by regulating firing rates to suit the need for steam.

**A complete package.** Cyclotherm is a complete package boiler, shipped ready to operate. Guarantees a minimum of 80% efficiency in two passes. For full information, write Cyclotherm Division, National-U.S. Radiator Corp., 29 E. First St., Oswego, N.Y. Models from 18 to 750 hp; 15 to 200 psi.



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Please send me your free booklet,  
Cyclotherm Cyclonic Combustion



## processing and engineering data

218

### Critical temperatures of nonpolar liquids

CLIFFORD L. DUCKWORTH  
East Alton, Illinois

The accompanying nomograph, designed to determine the approximate critical temperatures of nonpolar liquids and constructed through application of well-known methods<sup>2</sup>, is based on the relationships<sup>3</sup>

$$\frac{T_c}{T_b} = 0.283 \left( \frac{M}{d_b} \right)^{0.18}$$

$$\ln T_c = 9.8 \left( \frac{T_b}{T_c} \right) - 4.2$$

where  $T_b$  = temperature, degrees Kelvin, at which the liquid is in equilibrium with a molal vapor volume of 22.4 liters

$T_c$  = critical temperature, degrees Kelvin

$M$  = molecular weight of nonpolar liquid

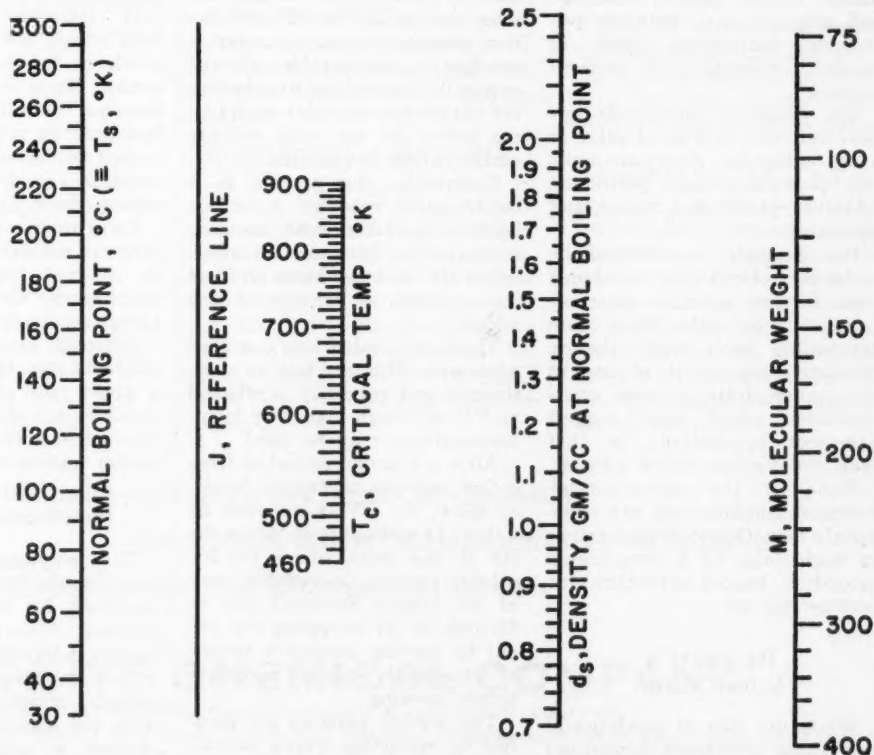
$d_b$  = density, gm/cc, at the normal boiling,  $T_b$ , degrees, Kelvin.

To determine the approximate critical temperature of a nonpolar liquid, draw a straight line from scale  $T_b$  to scale  $d_b$ . From the intersection with the reference line,  $J$ , draw a straight line to scale  $M$ ; then note the intersection with the scale  $T_c$  at the critical temperature.

This nomograph differs somewhat in ranges and design from that of Hooks and Kerze<sup>1</sup> which is based upon the same relationships.

#### LITERATURE CITED

- 1) HOOKS, I. J., and KERZE, FRANK, JR., *Chem. Met. Eng.*, 52 (6) 116 (1946).
- 2) PERRY, J. H., editor, "Chemical Engineers' Handbook," pp. 100-103, 3rd ed., McGraw-Hill Book Company, New York, 1950.
- 3) WATSON, K. M., *Ind. Eng. Chem.*, 23, 360 (1931); "Chemical Engineers' Handbook," p. 291, 3rd ed., McGraw-Hill Book Company, New York, 1950.





Anhydrous hydrogen fluoride catalyzes the . . .

# Condensation of aromatics with carbohydrates

Process gives many compounds that should prove of importance to detergent, pharmaceutical, petroleum additive, plasticizer, resin, and germicide fields

What has all the earmarks of a major break-through in the field of organic chemistry has been described by Dr. Carl B. Linn at the American Chemical Society's 132nd national meeting in New York City.

Dr. Linn, of the Universal Oil Products Company, has found a method of combining carbohydrates (sugar, starch, cellulose, and glucose) with aromatic petroleum derivatives (such as toluene, phenol, and dodecyl benzene).

The resulting compounds appear that they will be of value in many industries; detergent-making, pharmaceuticals, petroleum additives, plasticizers, resins, and germicides.

For example, a carbohydrate molecule chemically combined with certain aromatic pharmaceuticals may make them more compatible with body tissues. Another characteristic of some of the carbohydrate-aromatic combinations, which may suggest detergent applications, is that they are surface-active agents.

Some of the carbohydrate-aromatic combinations are completely new. Others were formerly made only by a complicated procedure, judged impractical for commercial use.

## The Secret is in the Catalyst

While the idea of catalytically combining petroleum derivatives with carbohydrates is not entirely new, the only method previously available for the preparation of

materials of this type — that developed by Hurd and Bonner under a Corn Products Refining Company fellowship — was too complicated and expensive to be commercially feasible or led to products of indeterminate structure.

Although Dr. Linn had considerable experience with hydrogen fluoride (he is one of the co-inventors of UOP's HF Alkylation process for making aviation gasoline), considerable doubt originally existed as to whether HF (hydrogen fluoride) would be too active for use with delicate carbohydrate compounds.

Essentially, the process is a condensation reaction. A carbohydrate is mixed with an aromatic in the presence of anhydrous HF. In some cases an inert solvent, such as pentane, is also added.

These are sealed into a stirred autoclave. The reaction is exothermic and generally is effected at 0°C, although higher or lower temperatures may be used.

After a reaction period of from a few minutes to twenty hours, or more, the HF is removed by either: 1) adding ice to dilute the HF to the point where the insoluble portion (containing most of the organic product) can be filtered, or 2) stripping the HF out by rapidly passing a stream of nitrogen through the autoclave before opening.

The organic portions are purified by extraction with a solvent, the choice of which depends on the hydrophilic-hydrophobic balance of the reaction product. The

balance is dependent upon the original ratio of carbohydrate to aromatic, and by the reaction conditions.

## Variations of the Reactants

Starch and cellulose are carbohydrates made up of long chains of glucose units. Because the HF catalyst breaks down these chains into individual glucose links, both starch and cellulose behave similarly to glucose in the reaction. Since a glucosyl radical becomes directly attached to a hydrocarbon molecule through a carbon-to-carbon linkage, the reaction can be called by the generic term "glycosylation."

Compounds with an entire range of solubilities in water and in oil-type materials can be tailor-made by the use of selected reactants.

Although several pure reaction products may be recovered from a given pair of reactants, it is possible to obtain the desired product in good yield by picking proper operating conditions.

## Identification Procedures

The empirical formulas for the reaction products were determined by analyzing sharply melting fractions. Molecular weight determinations were hard to obtain because many compounds appeared to associate with the solvent, in which they showed a gelling action. The presence of aromatic rings and hydroxyl groups were detected by chromic acid oxidation, anal-

yses of the crystalline acetate derivatives, by the infrared spectrometer, and in other ways.

It was seen that the basic unit structure of the relatively delicate carbohydrates stood up surprisingly well throughout the whole process of uniting with the hydrocarbon, even though the reactivity of HF is commonly considered "quite drastic."

## Commercialization

Since starch and its derivatives are so important to this reaction, and special skills were necessary to make the process commercially available, Corn Products Refining Company was invited to participate in the development. Both companies are making plans for the commercialization of the process and its products.

(Information on the process and its licensing may be obtained from either Universal Oil Products Company, 30 Algonquin Road, Des Plaines, Illinois, or Corn Products Refining Company, 17 Battery Place, New York 4, New York.)

Check 1837 opposite last page.

(Laboratory samples of two products — 1-deoxy-1, 1-di-(ortho-xylyl)-D-glucitol made from ortho-xylene and starch, and 1-deoxy-1, 1-di-(para-hydroxyphenyl)-D-glucitol made from phenol and starch — are available from Technical Div., Corn Products Refining Company, 17 Battery Place, New York 4, New York.)

Check 1837A opposite last page.



**Stabilizer protects paint characteristics during freeze-thaw**

Bactericidal qualities useful in protein formulations

**Uses:** For protecting latex paints against alternate freezing and thawing.

**Features:** Stabilizer is effective through a minimum of four freezes at  $-10^{\circ}\text{F}$  with no detrimental effect on scrubability of dried paint film. It



Stroboscopic photo sequence — paint in both cans went thru four freeze-thaw cycles. Stabilized paint is on right. Unstabilized paint is on left

has bactericidal qualities useful in formulations containing protein materials.

**Description:** Product is a formulated alkaline metal salt of N-coco beta amino butyric acid. Stabilization in oil-modified paints can be obtained with as little as 0.32% of the chemical on finished paint containing 12% latex solids. For oil-free latex paints, a slightly higher concentration is recommended.

Specs for this additive are:

Viscosity (cps @ $25^{\circ}\text{C}$ )	50-100
Color (Gardener max)	8
Percent Solids	$40 \pm 1\%$
pH (on meter)	9.9-10.8

(Armeen SZ is available in commercial quantities from Chemical Div., Armour and Co., 1355 W. 31st St., Chicago 9, Illinois.)

Check 1838 opposite last page.

# Now! ISOPHTHALIC based paints and plastics are leading the way to superior products

## Important new raw material of many uses

With Isophthalic now in plentiful supply from Oronite Chemical Company's 50 million pound per year capacity plant, paint manufacturers can produce new and better surface coatings that have superior flexibility, hardness, impact resistance, color and gloss retention. Plastics (Polyamides, Polyesters-amides, Polyesters) employing Isophthalic based resins open the door to new and better products at attractive cost.

### Paint

With Isophthalic, longer oil length resins (up to 93%) can be built that dry faster to tougher films, and the longer oil length results in significant cost savings.

### Baking Finishes

Isophthalic baking finishes are harder, have better gloss retention, are more resistant to alkali, water and mineral spirits. Less amino resin is required resulting in further cost savings.

### Exterior House Paints

Formulation of Isophthalic alkyd oils with pentaerythritol and low rosin content tall oil fatty acids produces house paints with superior drying properties than those made from soybean oil. The harder drying films of Isophthalic paints have better resistance to mold growth, film checking and cracking than conventional linseed oil paints. Exterior house paints made with Isophthalic have superior weathering characteristics, excellent non-yellowing properties.

### Interior Gloss Enamels and Flats

Odorless enamels and flats of excellent quality can be produced more economically with Isophthalic resins. Low rosin content tall oil acids used in longer (70-75%) oil length Isophthalic resins provides a low cost vehicle for interior enamels that are unusually flexible, have excellent gloss retention properties.

### Industrial Finishes

Industrial finishes that dry faster, adhere better to metal and that retain their gloss longer are now possible with Oronite\* Isophthalic. Such coatings are especially suitable as exterior structural steel paints, equipment finishes, enamel undercoatings and industrial primers.

### Plastics

The superior properties of polyesters made with Isophthalic are maintained even at high styrene dilutions. With Isophthalic high viscosities can be adjusted by further dilution with styrene without loss in properties. The excellent performance of Isophthalic at greater styrene dilutions offers new economies in the cost of materials for resin solutions.

**Plasticizers** made with Isophthalic have greater thermal and color stability, higher boiling points, better resistance to oxidation, greater plasticizing efficiency and less toxicity and no odor.

**Reinforced plastics**, of unsaturated polyester type that withstand higher temperatures, that can resist more flexing, that have higher impact strength and that have better adhesion to glass are now possible with Oronite Isophthalic. When Isophthalic based plastics are reinforced with glass, these properties carry over into the laminates resulting in superior resistance to water erosion and pressure.

Let Oronite prove to you how Isophthalic can benefit

your products. Oronite field representatives will be glad to

demonstrate to you the many advantages of Isophthalic



TRADEMARK

## ORONITE CHEMICAL COMPANY


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SALES OFFICES • New York, Wilmington, Chicago, Cincinnati, Houston, Los Angeles, San Francisco

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Check 1839 opposite last page.

"NOSEY"  says:



YOU want to be a good neighbor, don't you? Yet, 'taint too neighborly if your industrial plant spews out bad odors to make life sort of miserable for those people who are living near by! There's no excuse for this either, because odor control specialists, like FRITZSCHE, have worked out efficient ways for lickin' such conditions, and if you'll tell them your problem I'm sure they'll show you how to clear it up. You do want to be a good neighbor, don't you? Then write FRITZSCHE, today!

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*Brothers, Inc.*



Est. 1871

PORT AUTHORITY BUILDING, 76 NINTH AVENUE, NEW YORK 11, N. Y.

BRANCH OFFICES and \*STOCKS: Atlanta, Ga., Boston, Mass., \*Chicago, Ill., Cincinnati, O., \*Los Angeles, Calif., Philadelphia, Pa., San Francisco, Calif., St. Louis, Mo., Montreal and \*Toronto, Canada and \*Mexico, D. F. FACTORY: Clifton, N. J.

Check 1840 opposite last page.

*The Smart Trend in*

**PVA**  
**EXTENDERS!**

**Tamms**  
**GOLD BOND**  
**SILICA**

A functional extender pigment especially adapted to PVA formulation for scrubability, leveling and flat sheen. It is easily wetted and dispersible. pH of 6.5-6.8. Non-crystalline structure. Economical in cost.

TAMMS INDUSTRIES, INC.

Check 1841 opposite last page.

## CHEMICAL MATERIALS

**Commercially available  
dimethyl sulfide  
is 99+ % pure**

Product is a raw material, solvent, odorant

**Uses:** Dimethyl sulfide (DMS) will probably find its major use as a raw material in chemical synthesis of solvents, polymers, and chemicals for agriculture and the rubber industry. One derivative, dimethyl sulfoxide, is a powerful industrial solvent.

DMS in itself is a versatile solvent, and also finds use in natural gas odorants and as a perfume intensifier.

**Features:** Product has a purity of 99+ % and is available in tonnage quantity. Cost has been drastically reduced.

**Description:** DMS is produced by an exclusive licensed process which uses lignin and sulfur as raw materials. Lignin is a plentiful by-product from the kraft pulping of wood in making paper. It is expected that this process will also become the source of several other basic chemicals.

(Dimethyl sulfide is a product of Chemical Products Div., Crown Zellerbach Corp., Dept. P, Camas, Wash.)

Check 1842 opposite last page.

**Purified cellulose  
gives good tablet  
disintegration**

Tests show that in some cases it acts better than starch

Purified cellulose, used in 5% concentration as a binder, makes a very good disintegrating agent for compressed tablets, such as made by the pharmaceutical industry.

When tested in compressed tablets made of lactose (a highly water-soluble compound) and in tablets made of calcium gluconate (a slightly soluble compound), Solka Floc BW200 cellulose gave faster disintegrations than did corn starch in 10 out of 12 formulations. The USP disintegration test method was used.

Possible explanation lies in

how to cut the price of

# ACETONE

Users of Acetone, such as plastic screening manufacturers, have found a way to cut the price of this solvent and thereby reduce production costs.

By recovering 56c gal. Acetone with a Barnebey-Cheney automatic solvent recovery system, the price drops to 6c gal.—direct operating cost of the recovery equipment. Recovery is better than 99%, so the solvent can be used again and again at 6c gal.



Al Chemist says: "If you evaporate Acetone in quantity, you'll save important money with solvent recovery."

WRITE FOR BULLETIN W-17

ACTIVATED CARBON  
Purification & Recovery Equipment  
**BARNEBEY-CHENEY**

CASSADY AT EIGHTH COLUMBUS 19, OHIO  
Los Angeles • San Antonio • St. John's, Quebec

Check 1843 opposite last page.

Get  
This  
New  
**STRAUB**  
Catalog



**Describes the complete line of STRAUB gas generators.**

Efficient, compact STRAUB Gas Generators are available in three basic types — endothermic, exothermic and nitrogen. A wide variety of styles and sizes meet every need. If you have a gas blanketing or controlled atmosphere problem . . . . write for this helpful catalog.



**A. A. STRAUB COMPANY, INC.**

4936 Grayton Road, Cleveland 11, Ohio

Check 1844 opposite last page.

CHEMICAL PROCESSING



the fibrous nature of the cellulose. Its extremely long molecules cause a lattice effect within the tablet, in contrast with no lattice effect with the short, branched-chain molecules of starch. This lattice arrangement probably allows the solvent to enter the tablet more readily and cause faster disintegration.

The action of cellulose as a binder is seen during a Strong-Cobb hardness test. At the breaking point, the starch-containing tablet snapped into many small pieces, while the cellulose-containing tablet pulled apart from top to bottom in a ripping fashion, breaking into several large pieces.

As a lubricant, purified cellulose functions as a non-abrasive scouring agent, and is particularly effective with heat-sensitive and sticky substances.

Purified cellulose acts as an inert filler, and is accepted by the FDA for tablet formulations.

Disintegration tests were conducted by R. J. Bequette and C. Lee Huyek, St. Louis College of Pharmacy and Allied Sciences, St. Louis, Mo.

(Solka Floc BW200 is a product of the Brown Co., 650 Main St., Berlin, N. H.)

Check 1845 opposite last page.



"I know you only wanted a pound — but it's so much cheaper by the tank car."

# PETRONATE

(Reg. U. S. Pat. Office)

... the oil-soluble petroleum sulfonate for all four major functions ...

- A Emulsification and Dispersion of Liquids**
- B Dispersion and Wetting of Solids**
- C Wetting and Dispersion of Liquid-Solid Systems**
- D Inhibition of Rust and Corrosion**

PETRONATE is the general trade name given by Sonneborn to its various types and grades of oil-soluble petroleum sulfonates.

The chart suggests the broad range of uses for this material. A laboratory sample of PETRONATE will

help you determine how its many advantages can be put to efficient use in your manufacturing processes.

Check the coupon below indicating the use intended so that we can send you the proper type of PETRONATE.

## USES OF PETRONATE

APPLICATION	PRIMARY FUNCTION OF PETRONATE	SECONDARY FUNCTION
<b>EMULSIFICATION AND DISPERSION OF LIQUIDS</b>		
1. Insecticide Emulsions	Emulsifying Agent for Toxicant	Spreading Agent
2. Textile Oils	Emulsifying Agent for Textile Processing Oils	Wetting and Dispersing Agent for Textile Fibers
3. Leather Oils	Emulsifying Agent for Leather Processing Oils	Wetting and Dispersing Agent for Leathers
<b>DISPERSION AND WETTING OF SOLIDS</b>		
4. Rubber Manufacture	Thermo Plasticizing Agent	Increases Dispersibility of Filler
5. Fuel Oil	Keeps Sludge in Suspension	Prevents Segregation of Moisture
6. Printing Ink Manufacture	Aids dispersion of pigment	Reduces Viscosity of Ink
7. Ore Flotation	Flotation Reagent	Selective Wetting Agent
8. Additives for Lube Oil	Acts as Detergent	Inhibits Bearing Corrosion
<b>WETTING AND DISPERSION OF LIQUID-SOLID SYSTEMS</b>		
9. Crude Oil Emulsion Splitting	Reverting Agent for Water-in-Oil Emulsions	Aids in Wetting out Salts and Solids
10. Emulsifiable Solvent Cleaners	Dispersing Agent for Oil and Grease Deposits	Acts as Emulsifying Agent
11. Dry Cleaning Compounds	Linking agent for Water and Solvent	Loosens Dirt Absorbed by Fabric
12. Fat Splitting Process	Dispersing Agent for Solid Fats	Acts as Wetting Agent
<b>INHIBITION OF RUST AND CORROSION</b>		
13. Corrosion Preventive Compounds	Rust and Corrosion Inhibiting Agent	Acts as Moisture Barrier
14. Anti-Freeze Solutions	Rust and Corrosion Inhibiting Agent	Aids in Dispersion of Scale
15. Soluble Cutting Oils	Emulsifying Agent for Mineral Oil	Rust Inhibitor

**L. SONNEBORN SONS, INC.**

New York 10, N. Y.

White Oil and Petrolatum Division, L. SONNEBORN SONS, INC.  
300 Fourth Avenue, New York 10, N. Y.

Please send sample of PETRONATE suitable for use indicated below (circle number corresponding to use in chart above).

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ P.O. Zone \_\_\_\_\_ State \_\_\_\_\_

Check 1846 opposite last page.



# B.F. Goodrich Chemical raw materials

Hood for large plating tank, fabricated from 1/4" vinyl sheet. Hood and duct shown were made from sheets produced by Seiberling Rubber Company, using Geon rigid compounds.



## GEON RIGID VINYL DUCTS

carry away corrosion problems

WITH ducts, hoods, fans and fume stacks now being fabricated from rigid sheets made from Geon polyvinyl compounds, you can eliminate many corrosion replacement problems.

Rigid vinyl sheeting is available from many manufacturers in large sizes, in a range of gages, in normal or high impact grades. It is easy to form, can be worked with standard wood or metal working tools, and

can be readily welded. Sheets made of Geon rigid vinyl offer superior resistance to oils, acids, alkalis, and most chemicals.

For booklet on properties of rigid Geon resins and compounds write Dept. FJ-6, B.F. Goodrich Chemical Company, 3135 Euclid Avenue, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

Fume duct fabricated from 1/4" vinyl sheets.



B.F. Goodrich Chemical Company  
a division of The B.F. Goodrich Company



GEON polyvinyl materials • HYCAR American rubber and latex • GOOD-RITE chemicals and plasticizers • HARMON colors

Check 1847 opposite last page.

## CHEMICAL MATERIALS

Wiping a silicone fluid on lip of syrup bottle gives a clean 'pour'

'Vermont Maid' maple syrup is doing it commercially



Before: When syrup is poured, last drop runs down outside of bottle, making a sticky mess



After: One drop of silicone fluid wiped around lip makes it non-wetting. Syrup breaks clean and runs back inside of bottle

(Silicone fluid is a product of Dow Corning Corp., Midland, Michigan.)

Check 1848 opposite last page.

## Compressed gases, regulators

Catalog of 36 pages presents company's line of compressed gases and gas regulators. Compressed Gas cat — The Matheson Company, Inc. PO Box 85, East Rutherford, N.J.

Check 1849 opposite last page.

Improve cuts salt by 90 to

Uses: J ing salt h metals. B for street Feature salt brine 95%. It i toxic, as skin, anim and auto

Description forms a but tough metallic in contac slush. Ju inhibitor extended hibitor r it easier with salt required tributed ability to brine co tended p

(New Fo uct of C Hagan C Inc., 323 burgh 22

Check 1

Excellent temper in low-

Uses: cal adso Feature excellen ery, goo scrubbin ganic co These p with h high cr excellen ance.

Description face-act practical skeleton in mesh is easil mesh.

(Permu The Pe CP, 33 York 36

Check

**Improved rust inhibitor  
cuts salt brine corrosion  
by 90 to 95 percent**

**Uses:** Inhibitor for rendering salt brine non-corrosive to metals. Big use will be in salt for streets during icy weather.

**Features:** Product reduces salt brine corrosion by 90 to 95%. It is odorless and non-toxic, as well as harmless to skin, animals, plant life, paint, and automobile finishes.

**Description:** Rust inhibitor forms a microscopically thin but tough protective film over metallic surfaces which come in contact with resultant salt slush. Just 1% of new rust inhibitor (by wt) protects for extended period of time. Inhibitor resists caking, making it easier to handle and mix with salt. No special mixing is required for it is evenly distributed by traffic. It has the ability to protect against salt brine corrosion for an extended period of time.

(New Formula Banox is product of Calgon Co., a Div. of Hagan Chemicals & Controls, Inc., 323 Fourth Ave., Pittsburgh 22, Pennsylvania.)

Check 1850 opposite last page.

**Excellent adsorption,  
temperature resistance  
in low-cost adsorbent**

**Uses:** As general, economical adsorbent.

**Features:** Material exhibits excellent regeneration recovery, good capacity, and good scrubbing efficiency for organic compounds from vapors. These properties are combined with high settling velocity, high crushing strength, and excellent temperature resistance.

**Description:** Material is surface-active, adsorptive form of practically pure silica in a skeleton form. It is available in mesh sizes 30-50 mesh and is easily ground to pass 200 mesh.

(Permutit LG is product of The Permutit Company, Dept. CP, 330 W. 42nd St., New York 36, N. Y.)

Check 1851 opposite last page.

# BLOCKSON



## "Another **ONE STOP** shipment of phosphates from BLOCKSON"

You can buy all BLOCKSON chemicals in mixed carloads. ONE ORDER does it. ONE STOP delivery. ONE PHONE CALL for any schedule changes . . . carload prices on each chemical. See the list below.

**BLOCKSON CHEMICAL COMPANY • Joliet, Ill.**  
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Sodium Tripolyphosphate • Trisodium Phosphate • Tetrasodium Pyrophosphate • Tetrapotassium Pyrophosphate • Sodium Polyphos (Sodium Hexametaphosphate-Sodium Tetrakisphosphate) • Sodium Acid Pyrophosphate • Trisodium Phosphate Chlorinated • Disodium Phosphate • Monosodium Phosphate • Hydrofluoric Acid • Sulfuric Acid • Sodium Fluoride • Sodium Silicofluoride • Hygrade Fertilizer • Teox 120 (Nonionic Surfactant)

...SAME ADVANTAGES FOR  
MIXED TRUCKLOAD BUYERS



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Check 1852 opposite last page.

Haveg Equipment Solves Corrosion Problems in Handling  
ACIDS • ALKALIS • SOLVENTS • HF • FUMES

First name  
in Corrosion  
Resistant  
Equipment

**HAVEG**  
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## CHEMICAL MATERIALS

### Editor's Note:

No one can read the transcript of the panel discussion on food additives before the Health and Science Sub-committee of the Interstate and Foreign Commerce Committee of the US House of Representatives which took place on August 6 and 7, without being impressed by the general recognition of the value of chemicals as one of the important factors in making possible our country's superior food supply.

The committee pointed out that people eat what they like to eat, not what someone else thinks they ought to eat. The appearance, flavor, and texture of foods are tremendously important in stimulating the appetite and increasing the satisfaction and benefits that come from eating.

Chemicals—whether used as constituents of the unprocessed food or used as ingredients or reagents in its preparation—contribute many of the qualities which determine the acceptance of foods. Chemicals are very important to our well-being.

We thought you'd like to listen in on some thoughts on this subject by a man who has been associated with the production of high-quality chemicals for food processing for 34 years.

## The chemical industry and hand-in-hand, they make life better

### J. M. GILLET

Assistant to President  
Victor Chemical Works  
Chicago, Illinois

Today, all of us are living longer, and enjoy better health in our later years than at any previous time within recorded history. Many factors have made this possible, not the least of which is the abundance and quality of our food supply. Not only do we have a large quantity of high-quality food, but there is such a wide variety that we can choose foods that not only sustain life, but which make eating a pleasant and satisfying experience.

One of the major reasons this superior food supply can be made available is the use of chemicals. Chemicals can improve the appearance, the flavor, and the texture of foods. These qualities are tremendously important in stimulating the appetite and increasing the satisfaction and the benefits that come from eating food.

Substances manufactured by our chemical industry contribute many of the qualities

which determine the acceptability of foods. For example, a very small amount of calcium chloride in canned peas gives them firmness and preserves their natural color. Artificial sweeteners in dietary foods make it possible for the diabetic to really enjoy eating.

Delay of spoilage and maintenance of freshness while in the store or on the housewife's shelf owe much to the chemical industry. Not only does chemistry preserve the food's freshness, saving millions of dollars annually, but also makes possible modern refrigeration chemicals, corrosion-resistant and easily cleaned metals for processing equipment, and fuels that make possible fast and economical transportation to market.

### Nutrition

To make foods even more nutritive, the chemical industry supplies vitamins and minerals with which to enrich natural foods or to restore to them some of the desirable qualities which may have been lost in processing. Enrichment

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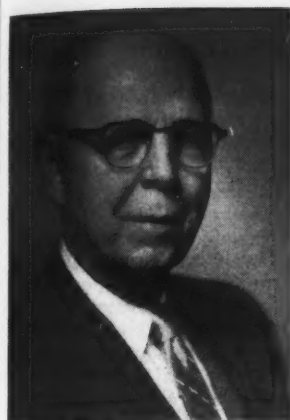
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**JAMES M. GILLET** has been with Victor Chemical Works for the past 34 years. Starting in technical service to the food industry, he was later placed in charge of the company's commercial research. At the present time, he is assistant to the president, and devotes particular attention to matters of legislation and government contacts.

Jim is a member of the Chemicals in Foods and the Air Pollution Committees of the Manufacturing Chemists Association. He is on the Industry Advisory Committee on Wholesale Price Index for Chemicals of the US Department of Labor. He is a chemical engineer, and his alma mater is the University of Wisconsin.

## Industry and foods make life better

of flour is a notable example.

In the thirties, we began to understand the importance of the "B" vitamins for our general well-being, of iron to combat anemia, and of niacin to overcome pellagra.

The wheat berry normally contains substantial quantities of the "B" vitamins. However, it is in a portion of the wheat that does not have consumer appeal. In spite of various campaigns to induce people to use whole wheat flour, the public insisted on white flour and white bread.

The milling industry, with the blessing of the medical profession and students of nutrition throughout the country, undertook the enrichment of white flour with vitamins, niacin, and iron for general consumption. The baking industry began to market bread that was similarly enriched.

In 1940 the Food and Drug Administration promulgated standards of identity for enriched flour. This meant that to sell an enriched flour, a miller had to conform to certain specifications in regard to the enriching additives. These

standards also permitted the use of calcium compounds as optional ingredients.

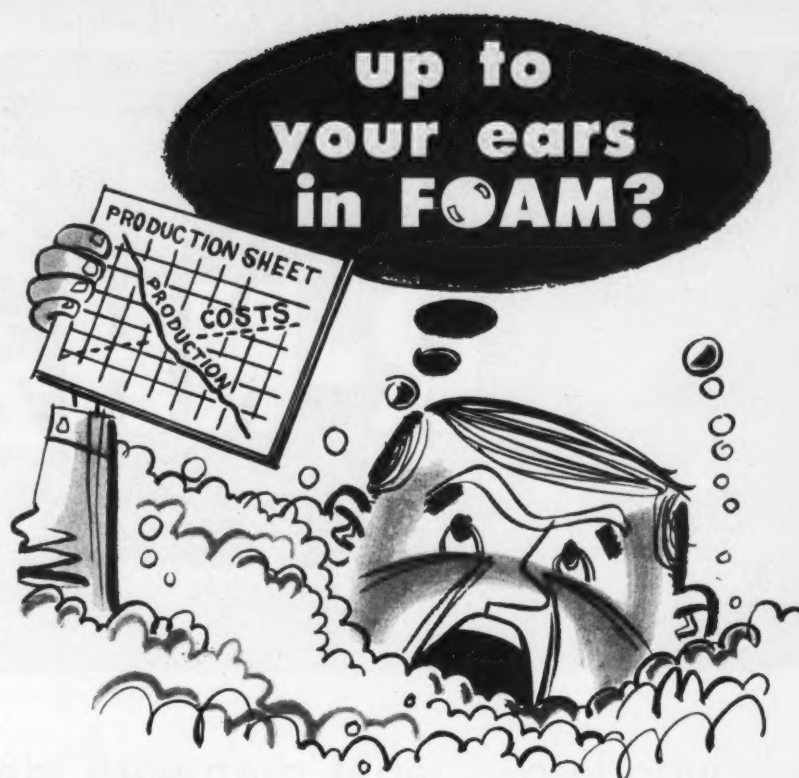
As a result, pellagra has been practically wiped out in this country, and millions of people are receiving vitamins, iron, and calcium in adequate amounts for their well-being.

### Agriculture

The objective of the food-producing industry is to produce adequate supplies of attractive, nutritious, clean, and health-sustaining foods. To attain it, they use the services of the chemist at every processing stage.

For the growing stage, the chemical industry supplies cures for many of the farmer's troubles — soil disinfectants to destroy nematodes, cut worms, and fungus diseases; insecticides to combat the ravages of insects; chemically produced fertilizers to restore the productivity of the soil and supply food for growing plants. Trace elements, too, are now being used to improve soils.

*To next page*



## then change to a Dow Corning SILICONE DEFOAMER

Why continue to let foam rob you of valuable processing space, inflate your costs, smother your production schedule? Why indeed, when only a teaspoonful of a Dow Corning SILICONE DEFOAMER will prevent mountains of that wasteful foam . . . help you operate at full capacity.

Effective against even the most violent foamers, Dow Corning SILICONE DEFOAMERS are so efficient they pay for themselves many times over. And remember when you use one of these economical silicone defoamers, you also free yourself from the worry of boil-overs and any fire hazards that may result.

So . . . stop choking on your FOAM problems—change to a Dow Corning SILICONE DEFOAMER.

### FREE SAMPLE

Put Dow Corning SILICONE-DEFOAMERS to the test. Use the coupon below or write on your letterhead to receive a free trial sample. No obligation, of course.

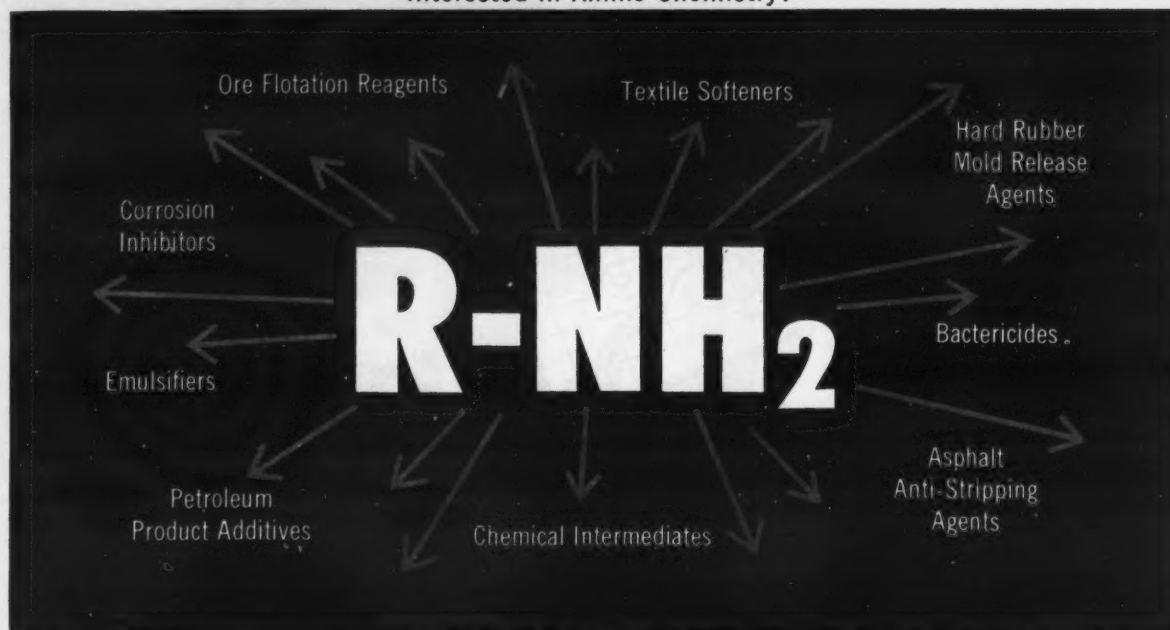


**Dow Corning CORPORATION**  
MIDLAND, MICHIGAN

NAME _____		3223	My foamer is _____ Oil system _____ Aqueous system _____ Other _____
TITLE _____			
COMPANY _____			
CITY _____	ZONE _____	STATE _____	
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Check 1854 opposite last page.

## Interested in Amine Chemistry?



(R represents a straight chain alkyl group with 8 to 18 Carbon atoms)

## who knows what men with ideas will do with General Mills **primary fatty amines?**

SPECIFICATIONS FOR PRIMARY FATTY AMINES (General Mills Alamines)			
PRODUCT	TRADE NAME	AMINE VALUE	IODINE VALUE
TECHNICAL GRADE—87% Min. Primary Amine Content			
Primary laurylamine	Alamine 4	270 min.	2.0 max.
Primary palmitylamine	Alamine 6	207 min.	2.0 max.
Primary stearylamine	Alamine 7	186 min.	6 max.
Primary coco amine	Alamine 21	250 min.	16 max.
Primary tallow amine	Alamine 26	192 min.	35 min.
Primary hydrogenated tallow amine	Alamine H26	192 min.	6 max.
Primary cotton amine	Alamine 33	192 min.	65 min.
DISTILLED GRADE—97% Min. Primary Amine Content			
Primary laurylamine	Alamine 4D	294 min.	2.0 max.
Primary palmitylamine	Alamine 6D	225 min.	2.0 max.
Primary stearylamine	Alamine 7D	202 min.	6 max.
Primary coco amine	Alamine 21D	272 min.	16 max.
Primary tallow amine	Alamine 26D	207 min.	35 min.
Primary hydrogenated tallow amine	Alamine H26D	207 min.	6 max.
Primary cotton amine	Alamine 33D	207 min.	65 min.
MIXED AMINES 60% min. primary amine content	Alamine 46	150 min.	20 min.

Many other primary amines from various fatty acids and Alamines in the form of water soluble acetic acid salts—trade name Alamacs—are also available. For more information contact . . .

### District offices:

**New York**, 156 William St.

**Chicago**, 460 So. N.W. Hy.,  
Park Ridge, Ill.

## CHEMICAL DIVISION

KANKAKEE, ILLINOIS

Producers of  
Sterols • Fatty Nitrogens • Versamid Polyamide Resins • Fatty Acids • Methyl Esters of Fatty Acids



Check 1855 opposite last page

## CHEMICAL MATERIALS

### Chemicals and Foods

From preceding page

Soil restoration affects not only the quantity but also the quality of the foods produced. The nutritive value, flavor, and appearance of the final food product is improved.

### Dairying

The livestock and the dairy farmers are dependent upon the chemical industry for mineral feeds and supplements, which raise the standards of livestock used for both meat and milk production.

One of the marvels of our age is the development of a dairy industry that can bring such a product as fluid milk—which by its nature is subject to very many hazards—to the table in pure and wholesome condition, and fit for consumption by not only persons in full health, but babies, invalids, and the aged.

Without the aid of chemical research and the products of our industry, this would have been impossible. The chemist has found materials that make it possible to meet the countless requirements of sanitation, characteristic of success in this industry. From the moment the cow enters the milking parlor until the cold milk is poured from the bottle or carton, chemical sanitizers keep the milk germ-free.

Another phase of the dairy industry is production of evaporated milk. Here, chemistry plays a different role. Satisfactory evaporation without curdling depends upon the ratio of various mineral constituents in the milk. At certain times of the year, these are not in the exact ratio, and no evaporated milk can be made. The chemical industry supplies potassium and sodium phosphates which, when added in minute quantities, maintain this critical ratio so that evaporation is possible.

The food processing industries—meat packers, flour millers, bakers, baby-food manufacturers, to mention a few—continuously require the services of a chemist to solve problems or improve quality, stability, packaging

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materials, and customer appeal. After the problems are solved, and chemicals are adequately tested by the biochemist and the pharmacologist and found to be free from hazard, the chemical industry supplies the required additives, reagents, assistants, and materials.

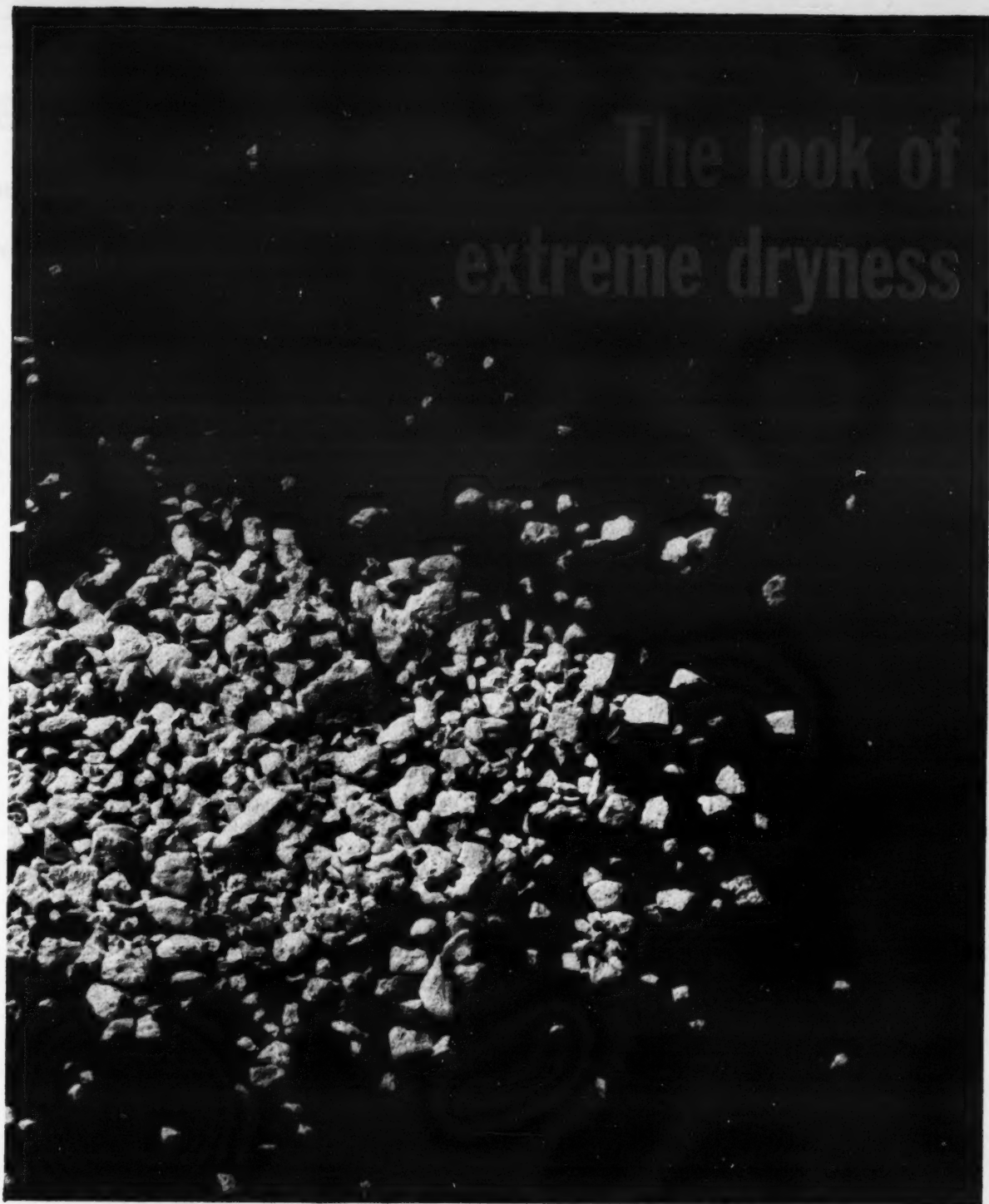
Close liaison between food producers, food processors, and the chemical industry is necessary, as well as a mutual understanding of each others problems. Colleges, universities, and agricultural experiment stations have also been in the forefront.

Two agencies of the Federal Government have played brilliant parts. These are the United States Department of Agriculture, with its research and its intimate contact with industries both great and small, and the Food and Drug Administration, through whose vigilance and skills industry has been helped in making these great strides without risk to the consumer.

It is no wonder that both the food and chemical industries are, hand-in-hand, making life better for all of us. ■



"I said take inventory,  
... what's this 'plenty of  
chlorine, oodles of soda  
ash' business?"



**for gases, liquids & vapors**—Looking for an efficient, economical adsorbent to obtain extreme dryness in gases, liquids or vapors? Then look to ALCOA® Activated Alumina, the oldest, most thoroughly proved commercial adsorbent available.

ALCOA Activated Alumina dries to lower dew points (minus 100°F and lower) than any other commercial desiccant. Nontoxic, noncorrosive and chemically inert, it relieves you of contamination worries and eliminates many serious main-

tenance problems. Because it remains fully effective through almost unlimited saturation-reactivation cycles, it insures lowest possible dehydration costs.

Let ALCOA help you solve your dehydration problems. Get complete information today on the properties and performance of ALCOA Activated Alumina. Write to ALUMINUM COMPANY OF AMERICA, CHEMICALS DIVISION, 705-L Alcoa Building, Pittsburgh 19, Pennsylvania.



**NEW!**  
**"ALCOA THEATRE"**  
Exciting Adventure  
Alternate Monday Evenings

Check 1856 opposite last page



### Ethyl parathion for insecticide formulators

Commercial production of technical grade ethyl parathion is underway at manufacturer's Memphis, Tennessee, plant. It is a phosphate insecticide which can be compounded into effective formulations for controlling mites and aphids. It is widely used on fruits and cotton, and also finds application on small grains and vegetables.

(Ethyl parathion is a product of Velsicol Chemical Corp., 330 E. Grand Ave., Chicago 11, Illinois.)

Check 1857 opposite last page.

### Polyethylene film uses

Polyethylene film — its applications on the farm and in home — are outlined in pocket-size 24-page booklet. Tips for cutting, taping, stitching, sealing, grommeting, and repairing in various uses are listed. Booklet D-502 — Chemical Div., Koppers Co., Inc., 1450 Koppers Bldg., Pittsburgh 19, Pennsylvania.

Check 1858 opposite last page.

### Ten organics available

Allyl cyanide,  $C_3H_5N$ , boils at  $119^\circ C$  and melts at  $-87^\circ C$ . It undergoes a wide variety of reactions due to its two functional groups.

$\alpha$ -Amino- $\beta$ -chloropropionic acid,  $C_3H_5O_2NCl$ , melts at  $160^\circ C$  with decomposition. It is an intermediate for DL-alanine, and forms DL- $\alpha$ ,  $\beta$ -diaminopropionic acid and also DL-cysteine.

Anthrarufin,  $C_{14}H_9O_4$ , melts at  $280^\circ C$ . It is used to make indanthrene and alizarine dyes, in biochemical and plant research, and in analytical chemistry.

Benzofuran,  $C_8H_6O$ , boils at  $173-175^\circ C$ . It forms useful resins when copolymerized with indene and indene derivatives. It also makes ink bases, bleaching powder composi-

## BRIEFS FOR BUYERS

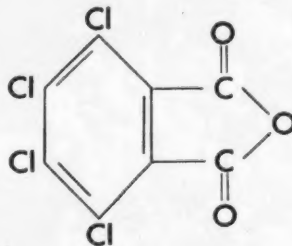
about Plastics Building Block Chlorin

New Intermediates • Caustic Soda • Caustic Potash

### Heat-stable building block makes plastics resist fire

If you want to build heat stability into a plastic product, take a good look at this molecule of tetrachlorophthalic anhydride, trade-named NIAGATHAL®.

Nearly half its weight is concentrated in four chlorine atoms, providing a very stable compound that won't melt unless you heat it to  $254^\circ-255^\circ C$ .



Translate these properties to read "fire resistance," "heat resistance," "good electrical qualities"—if, for example, you're adding NIAGATHAL to a polyester resin.

It's most effective in polyesters containing pigment or other filler—lets you load as much as 22% stable chlorine into such resins. When you do this, you come up with a polyester that's inherently, permanently self-extinguishing.

To help you evaluate this chemical, we've put together, in bulletin form, several published papers reviewing its properties and solubilities, its many reactions and suggested uses, as well as uses of derived compounds. To get a copy, just check the coupon for Bulletin 46.

If you'd like an evaluation sample of NIAGATHAL, please write on your business letterhead.

### Are you getting the best buy in chlorinated organics?

If you're buying or using chlorinated organics, it may pay you to ask yourself the following questions:

1. Are you making chlorinated intermediates yourself that you could buy more cheaply from Hooker?
2. Are you buying more than one chlorinated compound, from different

sources, that you could buy at a saving from one specialized source?

3. Would a chlorinated organic of higher purity than you're getting now improve your processing?

Why not call on your Hooker salesman to help you arrive at the answers?

**Monochlorobenzene** is an example of hundreds of chlorinated organics we've made. This product is typically 99.5% pure, as determined cryoscopically. It's so free from higher-boiling fractions that after drying, it distills within  $1^\circ C$ . It's used widely as an intermediate for insecticides, dyestuffs, pharmaceuticals, perfumes, and other organic chemicals; as a solvent for paints, varnishes, lacquers. You can have it delivered in 55-gallon steel drums or in tank cars.

Some others:

**ortho-Dichlorobenzene**, Tech. Contains 85 to 87% ortho-, 55-gal. drums, tank cars.

**para-Dichlorobenzene**, 100% para-, available in 7 mesh sizes, fiber drums.

**Trichlorobenzene**, Tech. Mixture of 1,2,4- and 1,2,3-trichlorobenzenes, the 1,2,4- predominating, 55-gal. drums, tank cars.

**1,2,4,5-Tetrachlorobenzene**, Solid; contains 65.7% chlorine, fiber drums.

### Sulfur chlorides for low-cost chlorination

As chlorinating agents, the sulfur chlorides provide you with low-priced sources of chlorine which are relatively easy to handle and store.

**Sulfur monochloride**,  $S_2Cl_2$ , is a definite compound with well-defined properties. This is not true of **sulfur dichloride**,  $SCl_2$ . In chlorination reactions, sulfur dichloride may be considered the equivalent of chlorine dissolved in sulfur monochloride.

In general, you can use sulfur monochloride and chlorine wherever sulfur dichloride is required. There are certain advantages in doing so, since sulfur monochloride can be purified by distillation and stored without gas pressure developing in the container.

Hooker sulfur monochloride is a yellow to slightly reddish heavy liquid containing 52.0 to 52.5% chlorine. Hooker sulfur dichloride, a brownish-red liquid, contains 66% min. chlorine.

For some helpful tips on chlorination with these and other Hooker chlorinating agents (chlorine, sulfuryl chloride, thionyl chloride, hydrogen chloride), check the coupon for Bulletin 328-A, **Hooker Chlorinating Agents**. You can use the coupon also to request technical data sheets on any of these chemicals.



### That new intermediate you need may be hiding in our woodpile

In this complex age, it can happen that the new intermediate you're seeking is closer than you think—cheaper, too.

Looking for something that has "never been made before?" Maybe it's in production already—for another use. Maybe you can get it in tank-car quantities.

Let's say you're on the trail of a new polymerization modifier. Your preliminary work indicates a mercaptan structure is desirable. It should have a freezing point below  $0^\circ C$ , a boiling range over  $100^\circ C$ . It should be a mobile liquid, light in color and with little or no odor.

Well, one compound that meets these requirements is our **lauryl mercaptan**— $C_{12}H_{25.7}SH$  (average). A strong advantage of lauryl mercaptan is availability.

This product is one of many that helped, in a modest way, to make wartime synthetic rubber more plentiful. It's still around—still being used as a modifier in the synthetic rubber "hot" process. We can ship it in carboys, drums, or by the tank car.

This is just one example of how checking with us might save you a costly development program, next time you need something new.

### Wet or How do

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## g Block Chlorinated Organics • Chlorinating, Sulfonating Agents

## e Potash Inert Lubricants • Phosphoric Anhydride

## Wet or dry

## How do you like your KOH?

If you're one of the relatively few people who prefer caustic potash in the solid state, we can provide you with any of these seven forms, all at 90% KOH:

1. Solid
2. Flake
3. Granular
4. Walnut
5. Broken
6. Powder
7. Crushed

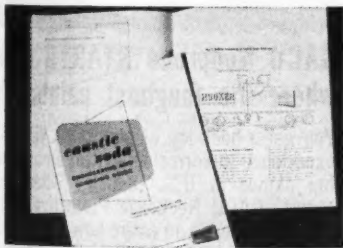
If one of these won't do, we can ship you 85%-strength KOH of even higher purity, in flake or solid form.

If you prefer your caustic potash liquid (it's generally cheaper and easier to handle), you can get it from us in concentrations between 45% and 52%, delivered in 55-gallon drums, tank cars of 4,000-, 6,000-, 8,000-, or 10,000-gallon capacity—or in duplex tank cars holding 3,000 gallons per compartment.

Is all this fuss worth while over a specialty alkali like caustic potash?

Well, our customers tell us it is. And they buy, under the NIALK® label, about half the caustic potash sold in this country.

We hope you'll think so, too.

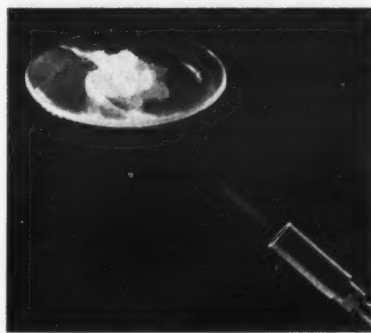


## 40-page manual tells how to handle caustic soda

Written for engineers, this 40-page Hooker manual sums up newest techniques for handling and storage of liquid caustic soda.

Contents include detailed diagrams of equipment; a section on materials of construction; recommendations for unloading, diluting, piping, and storage; and a section on safety precautions and first aid.

For a copy, check the coupon for Hooker Bulletin 102, *Caustic Soda Engineering and Handling Guide*.



## You can't burn this grease

You may at first be discouraged at the things you *can't* do to this product. But therein lies its value.

Besides being completely nonflammable, it won't break down in the presence of oxygen, hydrogen peroxide, concentrated mineral acids and alkalis. It's unaffected by heat up to 300° C; is stable at very low temperatures, too; is odorless and nontoxic.

What's its name? FLUOROLUBE®. It's a high-density addition polymer of trifluorovinyl chloride. The basic polymer can be fractionated into many grades, ranging from low-viscosity colorless oils through heavy oils to opaque greases. All have excellent lubricating qualities.

Fluorine and chlorine, accounting

for nearly 80% of the molecule, contribute to the high densities and complete fire safety of FLUOROLUBES.

What can you do with them? Some suggestions: lubricate ultraprecision instruments; seal pumps, valves, pipe joints in equipment handling oxygen, hydrogen peroxide, nitric acid, and other corrosives; lubricate PVC fittings, plug cocks, vacuum pumps in highly corrosive service.

You'll find other ideas on use, plus specifications and typical properties, in a data file on FLUOROLUBES which you can get by checking the coupon.

## What do you want to dehydrate?

If you have a drying problem, don't overlook phosphoric anhydride, P<sub>2</sub>O<sub>5</sub>. This OLDBURY product is one of the strongest known desiccants.

A white fluffy powder assaying 98% min. P<sub>2</sub>O<sub>5</sub>, it contains no sulfate. This is an important advantage in one of its major uses—as a condensing agent in making clear methacrylate resins.

If you're interested in phosphoric anhydride for a present or a potential use, just check the coupon for more complete information.

## for your file . . . new data on:

Sodium chlorate, NaClO<sub>3</sub> (OLDBURY®)  
Potassium chlorate, KClO<sub>3</sub> (OLDBURY®)

New data sheets on these two chemicals have been released. For copies, check the coupon on this page.

## For more information on chemicals mentioned on this page, check here:

- |  |   |
|--|---|
| <input type="checkbox"/> NIAGATHAL (Tetrachlorophthalic Anhydride) | <input type="checkbox"/> Lauryl Mercaptan   |
| <input type="checkbox"/> Monochlorobenzene                         | <input type="checkbox"/> Caustic Potash   |
| <input type="checkbox"/> ortho-Dichlorobenzene, Tech.              | <input type="checkbox"/> Bulletin 102, <i>Caustic Soda Engineering and Handling Guide</i> |
| <input type="checkbox"/> para-Dichlorobenzene                      | <input type="checkbox"/> FLUOROLUBES  |
| <input type="checkbox"/> Trichlorobenzene, Tech.                   | <input type="checkbox"/> Phosphoric Anhydride   |
| <input type="checkbox"/> 1,2,4,5-Tetrachlorobenzene                | <input type="checkbox"/> Sodium Chlorate  |
| <input type="checkbox"/> Sulfur Monochloride                       | <input type="checkbox"/> Potassium Chlorate   |
| <input type="checkbox"/> Sulfur Dichloride                         | <input type="checkbox"/> New list of products—Bulletin 100-A                              |

Clip and mail to us with your name, title, and company address. (When requesting samples, please use business letterhead.)

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PLASTICS

tions, and dye intermediates.

Biliverdin, C<sub>33</sub>H<sub>34</sub>N<sub>4</sub>O<sub>6</sub>, decomposes above 300°C. It is used in biochemical research, as an antioxidant for vitamin A and fatty acids, and in syntheses in the bile-pigment series.

Columbian chloride, NbCl<sub>5</sub>, boils at 246°C, and is useful in inorganic chemical research and analytical chemistry.

Ethyleneurea, C<sub>2</sub>H<sub>6</sub>N<sub>2</sub>O, melts at 131°C. It forms highly polymerizable vinyl and other derivatives, and is used in making lacquers, finishing agents, adhesives, plasticizers, and varnishes.

Juglone, C<sub>10</sub>H<sub>6</sub>O<sub>3</sub>, melts at 155°C, and possesses some fungistatic properties.

1-Naphthol-4-aldehyde, C<sub>11</sub>H<sub>8</sub>O<sub>2</sub>, melts at 181°C and is used in preparation of organic intermediates.

Sinigrin, KC<sub>10</sub>H<sub>16</sub>NO<sub>9</sub>S<sub>2</sub> · H<sub>2</sub>O, melts at 127-129°C. It has some antibiotic effect and retards oxidation of ascorbic acid. It is also useful in biochemical and pharmacological investigations.

(Organics are products of Bios Laboratories, Inc., 17 W. 60th St., New York 23, N.Y.)

Check 1860 opposite last page.

## PVC formulations improved with acrylic modifier

Uses: For improving properties of rigid and semi-rigid vinyl chloride polymers and copolymers which are processed by calendaring or extrusion.

Features: Use of modifier will significantly improve processing characteristics and physical properties of PVC formulations, permitting use of lower cost vinyl chloride polymers as starting materials.

Description: Acrylic resin modifier is supplied as fine white powder which may be blended directly with all types of vinyl resins.

(Acryloid KM-220 is product of Rohm & Haas Co., Dept. CP, Washington Sq., Philadelphia 5, Pa.)

Check 1861 opposite last page.

Check 1859 opposite last page.



# Difficult batching problems solved by Autoweightion\*

- All types and combinations of materials successfully handled
- High degree of accuracy obtainable
- Thayer Scale Flexure Plate Leverage System guaranteed accurate for life



Fig. 1

The development of the Thayer Autoweightion System for controlling materials processing systems has opened the door for many hitherto impractical batching operations. For instance, several different flushing materials (flooding powders) can now be handled without leakage by a tipping bucket weigh hopper (Fig. 1) controlled by a series of different range Thayer weigh beams.

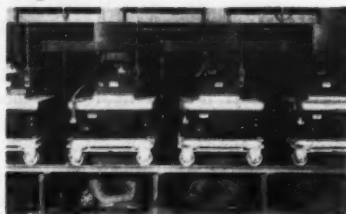


Fig. 2

Thayer individual batching scales can be used to furnish pre-weighed charges which may be varied in weight to suit the formula. The system shown (Fig. 2) can be furnished to allow positioning under various bins or feeders so each scale will preweigh a given weight charge and discharge it to a conveyor belt or to a mixer for further processing.

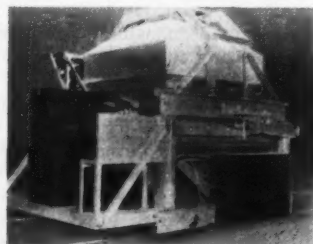


Fig. 3

Where many ingredients are to be handled and there is a factor of space saving and a minimum amount of equipment, it is possible to utilize an accumulative batching scale which can either be fixed or moveable as shown (Fig. 3).

This unit will have a large weigh hopper sufficient to accommodate the total weight of any number of ingredients desired to be accumulated. To secure accuracy in various weight ranges, the weighing of each individual ingredient will be controlled by its own weigh beam on the scale and the various ingredients will be weighed into the common weigh hopper in turn at the prescribed formulated weight.

**Difficult to handle materials**, such as hot tar, high viscosity liquids and other such ingredients which leave a residue in the weighing vessel can be handled in a loss-in-weight manner by first precharging a vessel to any weight and then withdrawing a known amount for the desired charge (Fig. 4). By this means the remaining tare weight within the hopper will not affect the weight of the next discharged load. Such a unit can be used either as a single batching scale or as an accumulative batching scale discharging in a loss-in-weight manner.

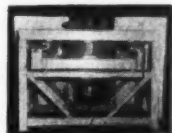


Fig. 4

**Engineered solutions** such as these have put Thayer batching systems into many of the best known processing plants in North America. Thayer builds a complete line of feeders interlocked with Thayer Scales. Remote controls, adding machines and chart indicators are also supplied. Please write us about your batching problems.

## AUTOWEIGHTION

trade-mark

\* THE THAYER SYSTEM OF  
PROCESS CONTROL BY WEIGHT

**THAYER SCALE CORP.**

6 Thayer Park, Pembroke, Massachusetts

Check 1863 opposite last page.

## CHEMICAL MATERIALS

### Hydrazine derivatives — choice of three

Hydrazine dihydrochloride, melting at 198°C, is used as chlorine scavenger for hydrochloric acid gas streams, and as an ingredient in copper cleaners and aluminum soldering fluxes.

Hydrazodicarbonamide (biurea) (mp:256-258°C.) suggests applications as chemical intermediate, as base constituent for polyamide thermosetting resins, and as growth-regulating agent.

Monohydrazinium phosphate (mp:81-83°C) should be an excellent oxygen scavenger for treatment of boiler feed-water. Product also shows promise as chem intermediate.

(Hydrazine derivatives are available in laboratory quantities from Industrial Chemicals Div., Olin Mathieson Chemical Corp., Dept. CP, Baltimore 3, Md.)

Check 1863A opp. last page.

### Aluminum foam offers design, construction possibilities

Just emerging from the research stage is a continuous process for making foamed aluminum. Eventually, the process may be developed to the point where foamed strips several feet wide, 3 to 4 inches thick, and in continuous length may be made.

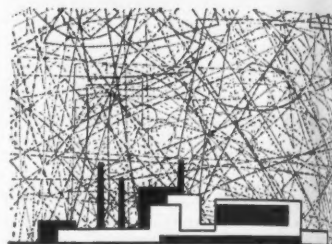
This suggests use as a rust- and insect-resistant construction material for buildings, as a reinforcement for laminates, and acoustic blocks and floats. The US Air Force sponsored the development in its search for new, light-weight materials for aircraft. Development cost \$100,000 and took five years.

#### How Foam is Made

The idea is very simple. A powdered hydride is dispersed through liquid aluminum. As it releases hydrogen gas, the metal is cooled with water sprays to keep the bubbles from collapsing. The finished product looks like a long

## SITUATION WANTED

### PLANT NEEDING HEAVY DUTY CORROSION PROTECTION



If paint is doing a satisfactory job of protecting your plant structure or equipment against chemical fumes, splash or spray, stop right here. If not, GACO Neoprene N-700 Maintenance Coating is a product you should know about. It wraps a film of tough, elastic Neoprene rubber around metal, wood, or concrete; offers the advantages of higher resistance to corrosive agents, wide temperature ranges, sunlight, weathering, surface abrasion—and at lower applied cost.



### GACO Neoprene STARTS work where the toughest paints fail

You get a back-log of almost 20 years of experience in corrosion control among the top names in U.S. Industry when you specify GACO Neoprene Protective Coatings. And there's an entire family of GACO products and services available including field technicians, laboratory, fabrication, and lining facilities. A GACO Corrosion Specialist in your area is prepared to serve you. For complete information, write—we'll forward literature of interest.

### GATES ENGINEERING COMPANY Wilmington 99, Delaware

Pioneer Leader In Protective Coatings

Authorized Distributors in principal cities U.S.A. Australia, Belgium, England, Finland, France, Israel, Japan, Korea, Okinawa, Philippine Islands, Puerto Rico, Sweden, In Canada, Gaco Products Ltd., Brantford, Ontario.

Check 1864 opposite last page.

CHEMICAL PROCESSING



piece of french bread and has a density of about 15 lb/cu ft. (Balsa wood has a density of 12 lb/cu ft.)

Higher densities can be made by compressing the foamed metal. (This does not destroy the cell structure.) Both open-cell, water-absorbent sponge and closed-cell, non-water-absorbent foam can be made.

#### Physical Properties

Tensile and flex strength which may be expected of the foams: from 70 to 90% of a value reduced from that for ingot aluminum, proportionate to the reduction in density. (Thus, if ingot aluminum weighs 170 lb/cu ft and has a strength of 30,000 psi, a block of foam weighing 17 lb/cu ft will have a strength of about 70 to 90% of 3000 psi.)

Rigidity and malleability are high. Notch impact sensitivity is low. The foamed aluminum can be sawed, nailed, cemented, screwed, or bolted. Casting, welding, or forging would be extremely difficult.

#### Possible Commercial Production

Any questions on large-scale production should be directed to any of the following.

MR. KIRBY F. THORNTON, Asst. Mgr., Sales Dept., Aluminum Corporation of America, New Kensington, Pennsylvania.

MR. JOHN R. YOUNG, Product Development, Kaiser Aluminum and Chemical Sales, Inc., 228 N. La Salle St., Chicago 1, Ill.

MR. RICHARD S. REYNOLDS, JR., President, Reynolds Aluminum Corp., Richmond, Va.

Foamalum Co., PO Box 433, Jamesville, Wisconsin.

(Aluminum foam was developed at Bjorksten Research Laboratories, Inc., PO Box 265, Madison 1, Wisconsin.)

Check 1864A opp. last page.

#### Organic intermediates

Producer of organic intermediate chemicals offers 24-page catalog listing products. Product cat.—Pfister Chemical Works, Inc., Ridgefield, N.J.

Check 1865 opposite last page.

## INTERNATIONAL MAGNESIUM OXIDE 99.0+%

*In the highest purity ever produced in carload quantities and in the low price range*



International MgO has demonstrated its versatility and superiority in these and many other applications—

• **AS A STABILIZING AND VULCANIZING AGENT FOR RUBBER**

• **IN HIGH TEMPERATURE HEATING ELEMENTS**

• **AS A PRECIPITANT OF YELLOW CAKE IN URANIUM ORE TREATMENT MILLS**

• **IN PRODUCTION OF HIGH-MELTING-POINT REFRACTORY BRICKS**

International's research staff is prepared to give you technical assistance in the study of end use problems. Please use the coupon in requesting samples and more information.

#### chemical specifications

chemical		purity range
MAGNESIUM OXIDE	MgO	99.00 — 99.80%
IRON	Fe <sub>2</sub> O <sub>3</sub>	0.04 — 0.06
LIME	CaO	0.07 — 0.08
SILICA	SiO <sub>2</sub>	0.05 — 0.10
ALUMINA	Al <sub>2</sub> O <sub>3</sub>	0.04 — 0.09
BORON	B <sub>2</sub> O <sub>3</sub>	0.003 — 0.01
CHLORIDE	Cl	0.02 — 0.04
SULFATE	SO <sub>4</sub>	0.03 — 0.05
SODIUM AND POTASSIUM	Na + K	0.02 — 0.04
LOSS ON IGNITION		0.20 — 0.30

#### physical specifications (Color . . . White)

**PELLETS**  
Approx. 3/4" x 3/4", plus 12 mesh  
Bulk density: 60 lb. cu. ft.

**GRANULAR**  
All minus 12 mesh  
Bulk density: 70 lb. cu. ft.

**POWDERED**  
100% minus 200 mesh  
90%+ minus 325 mesh  
Bulk density: 80 lb. cu. ft.

#### shipments

Bulk in box cars and covered hopper bottom cars, minimum 30 tons net.  
80 lb. net multi-ply paper bags with moisture resistant barriers and 100 lb. net fiber drums for carload, truckload and L.C.L. deliveries.  
All shipments F.O.B. Carlsbad, New Mexico.  
Direct truck service to all points in the Colorado plateau on 24 hours' notice.

#### price range

International MgO prices range from \$110 to \$250 per ton, F.O.B. Carlsbad, depending on grade, packaging and quantity.

### INTERNATIONAL MINERALS & CHEMICAL CORPORATION

POTASH DIVISION . . . . . 20 N. Wacker Drive, Chicago 6

485 LEXINGTON AVE., NEW YORK 17

MIDLAND, TEXAS • FULTON NATIONAL BANK BLDG., ATLANTA, GA.

LOOK TO  
INTERNATIONAL  
for these other industrial chemicals

Caustic Potash	Sulfate of Potash
Carbonate of Potash	Potassium Chloride
Liquid Chlorine	Muriatic Acid
Hydrofluosilicic Acid	

INTERNATIONAL MINERALS & CHEMICAL CORPORATION  
20 North Wacker Drive, Chicago 6

☐ Please send me samples of MgO in \_\_\_\_\_ form  
(pellet—granular—powdered)

☐ Please send Magnesium Oxide Brochure

My field of interest for MgO is \_\_\_\_\_

Name \_\_\_\_\_

Firm \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

Check 1866 opposite last page.



Associated Architects: Harrison & Abramovitz and John B. Peterkin. General Contractor: Turner Construction Co. Building Owners: Galbreath Corporation—John W. Galbreath and Peter B. Ruffin.

It took four to make the job of decorating the offices of Air Reduction Company, Incorporated—in the immense new Socony Mobil Building in mid-Manhattan—uniquely successful.

*One*—J. I. Hass, painter contractor, says of the paint—formulated with Colton Flexbond 800—used on Airco's office walls, "Our men found that with Flexbond 800, paint is easy to apply, quick to dry and odorless. Spots and smudges wash off easily."

*Two*—The paint was made by Socony Paint Products.

*Three*—Tinting colorants used for the *thirty* different wall colors were furnished by The California Ink Company, Inc., San Francisco, whose famous semi-annual Colortrend Reports, showing actual swatches of today's best-selling colors, are available to paint manufacturers.

*Four*—Flexbond 800 copolymer acetate emulsion (the vehicle), a product of Colton Chemical Company, added easy brushing, quick drying, odor elimination, sheen uniformity and film integrity to the paint.

Colton representatives have important information for you about Flexbond 800. Write Dept. A42.



**COLTON CHEMICAL COMPANY**

A Division of Air Reduction Company, Inc. • 1747 Chester Avenue • Cleveland 14, Ohio

Sales Offices and Warehouse Facilities Throughout U. S. • Export: Airco Company International, New York 17, N. Y.

Check 1867 opposite last page.

## CHEMICAL MATERIALS



Cotton-like Carbon Wool weighs 1/2 lb/cu ft

## Pure carbon fibers open new possibilities in filtration and heat insulation

Strong, clean, and 5 to 50  $\mu$  in diameter,  
fibers can be treated, woven, or used as-is

Although it may be quite some time before we will be wearing clothing made of pure carbon or sleeping under a pure carbon blanket, a wide scope of important industrial uses are foreseen for pure carbon in cotton-like form.

Called Carbon Wool, the element in this form has good physical properties. It can be activated or can be used in inert form. When activated, the wool has adsorption characteristics equal to conventional activated carbon in granular form. It retains its good physical properties too.

Although the carbon is inert to chemical reactions other than oxidation, it may be

coated with metallic oxides to reduce flammability in high-temp insulation uses, to improve its catalytic abilities, to change selective adsorption characteristics, or to change its color.

The carbon fibers can be matted, or made into yarn and woven into cloth. The wool can be made to exhibit variable specific resistances for use in electronic applications as sensing elements, transducers, and conductivity devices.

Big advantage of the wool is that it gives a low pressure drop for fluids and is easy to handle, such as in removing for reactivation.

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## Specific Uses

**Sugar and syrup manufacture** — In decolorizing, de-flavoring, and clarification in sugar-making.

**Vegetable and animal fats and oils** — Carbon Wool is very efficient and effective in deodorizing, decolorizing, and clarifying these substances.

**Smog and cigarette filters** — The wool's low pressure drop and its affinity for longer chain molecules (many irritants are in this category) make it of value here. Used in air conditioners, Carbon Wool filters odors as well as dust from air.

**Alcoholic beverages** — Carbon Wool is very efficient in removing fusel oil, ketones, and long-chain aldehydes.

**Food processing** — For filtering and improving the flavor of fruit and vegetable juices, soups, and instant coffee.

**Water purification** — In algae control, odor reduction, and purification of water, Carbon Wool gives superior performance and is easy to use.

**Biochemical separations** — Tests indicate that the wool will prove of great value in separating hormones, vitamin-bearing oils, and many pharmaceutical materials.

**Atomic energy** — In "hot chemical" processing, radioactive dust filtration from gases, and in insulation for high temperatures and corrosive atmosphere, Carbon Wool is of value. The wool withstands heat above 5450°F when in an inert atmosphere (such as argon). It will pick up "hot" materials and permits their recovery because the carbon filter can be burned.

**Gas separation** — Isotopes and radioactive substances can be separated on small and large scale.

**Liquid-phase purification** — It can be used with wax and oils, glue, soap, rosin, coke-plant and other wastes, and liquid carbon dioxide, to mention a few.

**Pharmacology** — Carbon Wool can be used wherever ordinary forms of carbon are employed.

To next page



## Symbol of a bright future

This distinguished award marks another

forward step in scientific achievement

URANIUM . . . zirconium . . . titanium . . . these are some of the exciting metals of the atomic age. They represent a new era in metallurgy — the use of chemical engineering techniques to separate metals from their ores.

**For their work** in extractive metallurgy, a number of companies received the 1957 Award for Chemical Engineering Achievement. Three operations of Union Carbide were cited: Electro Metallurgical Company for titanium, Union

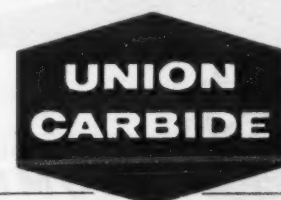
Carbide Nuclear Company for uranium, and Oak Ridge National Laboratories (operated by Union Carbide) for uranium and zirconium.

**The people of Union Carbide** are proud to be among those receiving the 1957 Award . . . just as they were honored in 1933, 1943, 1946, and 1953.

**Such pioneering research** in many fields at Union Carbide is helping bring forth new and better materials for a bright future.

**FREE:** Learn how research at Union Carbide helps improve many of the products you use every day. Write for "Products and Processes" booklet P.

Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y. In Canada, Union Carbide Canada Limited, Toronto.



### UCC's Trade-marked Products include

ELECTROMET Alloys and Metals	CIRAC Agricultural Chemicals	EVEREADY Flashlights and Batteries	UNION CARBIDE Silicones
PREST-O-LITE Acetylene	VISQUEEN Plastic Film	PRESTONE Anti-Freeze	HAYNES STELLITE Alloys
Dynel Textile Fibers	BAKELITE, VINYLITE, and KRENE Plastics	NATIONAL Carbons	UNION Calcium Carbide
			PYROFAX Gas

Check 1868 opposite last page.



# CSC NITROPARAFFINS as solvents in VINYL COATINGS

offer **5** important advantages!

1. Lower Viscosity!

2. Higher Solids!

3. Slower Evaporation Rate  
and Better Flow!

4. Less Solvent Retention!

5. Reduced Odor Problems!

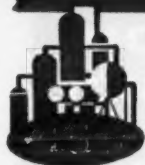
Studies at CSC's Lacquer Laboratories show that 2-Nitropropane and Nitromethane outperform the ketones in the preparation of vinyl spray formulations. Formulators can now take fullest advantage of the superiority of CSC Nitroparaffins in producing high-quality vinyl coatings.

High solids vinyl formulations prepared with 2-Nitropropane have good stability and show no tendency to gel during storage. 2-NP resin solutions are considerably lower in viscosity than mixtures based on medium-boiling ketones, allowing higher weights of solids in a given volume of lacquer and thus greater surface coverage.

The higher evaporation rates of the ketones normally used are serious handicaps leading to rapid setting up of films and poor flow. Flammability is a constant fire hazard. The slow evaporation rate of 2-NP and Nitromethane solutions produce good flow. The NP's have mild, agreeable odor and escape more rapidly when drying, eliminating odor problems. High flash points and low volatility are added safety features.

2-Nitropropane and Nitromethane are also excellent solvents for acrylics, cellulose acetate, cellulose acetate butyrate, and epoxy resins.

A CSC technical representative will be glad to work with you on your specific problems.



DISCOVER THE NITROPARAFFINS!

INDUSTRIAL CHEMICALS DEPARTMENT

**COMMERCIAL SOLVENTS CORPORATION**

260 MADISON AVE., NEW YORK 16, N. Y.

Atlanta • Boston • Chicago • Cincinnati • Cleveland • Detroit • Houston • Indianapolis • Kansas City  
Los Angeles • Louisville • Memphis • Milwaukee • Minneapolis • Newark • New Orleans • New York  
Pittsburgh • St. Louis • San Francisco • IN MEXICO: Comsolmex, S. A., Mexico 11, D. F.

Check 1869 opposite last page.

## CHEMICAL MATERIALS

### Pure Carbon Fibers

From preceding page

**Protection against toxic gases** — Extreme lightness of the wool and ease of breathing through it make it of use in gas masks.

**Analytical use** — The wool can be used in chromatographic analysis.

**Solvent recovery** — Carbon Wool makes recovery of volatile solvents both economical and satisfactory.

**Catalysts** — As an active adsorbent or inert catalyst support, the wool can be used in halogen reactions, isomerizations, hydrogenations, desulfurization, and oxygen reactions.

**High-temp insulation** — The ability to make ropes, blankets, and mats from Carbon Wool — plus its resistance in an inert atmosphere to temperatures as high as 5450°F — give it value as high-temp insulation.

**Packings** — Wool may make good tower packings, valve packings, and caulking material.

**Miscellaneous uses** — These include storage and transportation of gases, protective fabrics for vesicant vapors, prevention of color migration in rubber, anti-corrosion coatings, and nose filters.

### What It Is

"Details of Carbon Wool's manufacture are being kept under wraps. However, the process has been generally described as the gradual dehydration and carbonizing of rayon in controlled atmospheres."

Carbon Wool is a dense, fibrous form of amorphous carbon. Its appearance is sleek, glossy, and black. Individual fibers are strong and clean and show extraordinary density. However, in bulk, they are light and fluffy, weighing 1/4 pound/cu ft. Fibers can be produced in a range of diameters from 5 to 50 microns, and with a number of characteristics.

One big advantage with Carbon Wool is that it can be activated to a high level with no appreciable loss in physical

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CESSING

properties. The activated fiber has adsorption characteristics equal to conventional activated carbon in granular form.

The activated wool has a CWS chloropicrin service time range from 30 to 60 minutes, a  $\text{CCl}_4$  adsorption value of 30%, adsorption index for iodine (average of 30 tests) indicated a value of 82.1%. Flow characteristics for a 20" x 20" x 1" filter passing a velocity of 500 SCFM, showed a pressure drop of 0.08"  $\text{H}_2\text{O}$  and 79% efficiency.

An approximate analysis of the wool shows it is 92.8% fixed carbon, 0.6% ash, and moisture loss at 220 F is 6.6%.

X-Ray diffraction showed the wool to be amorphous and unoriented. Infrared examination indicated that there may be some carbonyl and conjugated linear unsaturation. A few aliphatic carbon-hydrogen bonds were also observed.

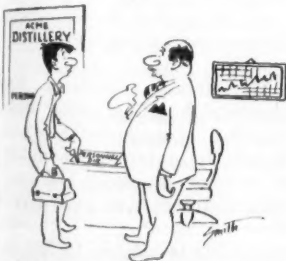
(Carbon Wool is a product of Atomic Laboratories, Inc., 3086 Claremont Ave., Berkeley 5, California.)

Check 1870 opposite last page.

#### Silicone-based lubricant

Variety of heavy-duty industrial applications of silicone-based lubricant are in four-page bulletin. Properties, performance data are included. Bul 6-209—Dow Corning Corp., Midland, Mich.

Check 1871 opposite last page.



"And remember, as you begin your employment with us, 76% of the human body is water . . . try to keep it that way."

## LOOKING FOR . . .

fume depressant?  
surface active agent?  
wetting agent?  
an emulsifier?  
acid inhibitor?

# AKWEONS

## #674

### . . . a new fatty acid derivative by Swift & Company

Akweons 674 is a versatile new fatty acid derivative which has demonstrated unique and outstanding properties in uses such as: a wetting agent, surface active agent, corrosion inhibitor, and emulsifier. Users report excellent results where it has been used as an acid fume depressant.

It is a dark reddish-brown liquid which pours readily at room temperature and is soluble in acidic, alkaline or neutral solutions.

Akweons 674 has found ready acceptance as an acid additive for pickling among steel producers and fabricators because, they say, it offers a trio of advantages found in few, if any, such product:

- As an acid corrosion inhibitor, Akweons serves to protect the base metal after scale and other contaminants have been removed.
- It serves to minimize "sulling" or flash rusting of the pickled steel after rinsing.

- Akweons reduces noxious acid bath fumes to promote better working conditions and serves to protect plant equipment by attacking corrosion at its source.

#### What can AKWEONS 674 do for you?

Because of its excellent surface activity at all pH values, AKWEONS 674 can be useful as a surface active agent or wetting agent, emulsifier or fume depressant. It should be particularly useful in acidic solutions in which most surfactants are ineffective.

This wide range of properties is available to offer new or improved process and product possibilities—perhaps for you. Swift & Company will be glad to provide details and a trial quantity for your evaluation. Just return the coupon or write for details.



To Serve Your Industry Better

SWIFT & COMPANY  
Technical Products Dept.  
1830 165th St., Hammond, Ind.

O-32

☐ Please send details on AKWEONS

☐ Please send trial order form with details

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

Your Name \_\_\_\_\_

Check 1872 opposite last page





Consumers are invariably guided by first impressions . . . and in plastic and rubber household goods, a repulsive odor can arouse displeasure — even before a product is used.

Fresh, clean fragrances . . . economically provided by RESODORS and PARADORS . . . sell and resell plastic and rubber products. Objectionable odors are gone and the customer's

first encounter with your product is a pleasure.

Insure consumer acceptance with RESODOR and PARADOR fragrances. Several types are available, all residual, heat stable and harmless to tensile strength or color. Write Sindar, describing your product, for samples and technical service.

**SINDAR** Corporation  
Industrial Aromatics and Chemicals

330 West 42nd Street  
New York 36, N. Y.

Check 1873 opposite last page.

**Electrical Porcelain RASCHIG RINGS**

**KNOW YOUR SOURCE  
BUY DIRECT  
from the  
MANUFACTURER**

Over 35 years of Experience has taught many the real economy of **KNOX TOWER PACKINGS** for initial installations as well as replacements. For your added protection and satisfaction, sales are made direct, to you, the ultimate consumer. **KNOX** has top flight engineering facilities for the actual production of **TOWER PACKINGS**, including:

RASCHIG RINGS  
BERL SADDLES  
PARTITION RINGS  
etc.

You are thus assured of the very finest of high grade vitrified porcelain with zero porosity. Repeat orders or carload after carload, year in and year out, assures us our Quality is positively SUPERIOR to any porcelain **TOWER PACKING** on the market.

**TRY US**  
Ask for Samples

**Always Specify**  
**KNOX**  
Tower Packings

**KNOX PORCELAIN CORPORATION**  
KNOXVILLE 1, TENNESSEE

Check 1873A opposite last page.

## CHEMICAL MATERIALS

# Precipitates protein efficiently and economically

**Aids industrial processing  
and waste treatment**

Pure alkali lignin or its sodium salts, react with water-soluble proteins to form a stable complex which readily precipitates at reduced pH. Resulting flocs serve as nuclei for insoluble proteins and permit rapid separation by filtration, centrifuging, or settling, thus providing an economical and efficient means of removing proteins from aqueous systems.

**Uses:** Specifically, here are the processes that can benefit.

1) Treatment of waste effluents and protein recovery. Precipitation of protein before discharging effluent minimizes protein contamination of streams. Protein precipitation not only reduces BOD (biological oxygen demand) of the effluent, but permits recovery of valuable proteins. This is particularly important to tanneries, and grain, dairy, vegetable, and meat processing plants.

2) Proteinaceous liquors. Process permits efficient separation of high-mw proteins from almost all types of proteinaceous liquor.

3) Emulsion breaking. Protein-stabilized emulsions of natural oils can cause difficult and costly processing problems. Adding alkali lignin as a solution greatly reduces the solubility of the protein acidulation. Acidulation causes precipitation of the lignin-protein complex, giving clean separation of the emulsion as the oil floats to the top.

4) Antibiotics and vitamin production. Before recovery of many antibiotics and vitamins, proteins and other impurities present in antibiotic fermentation liquors are often removed by acidifying, heating, and filtering. Filtering speed and protein removal can be upped by first complexing the protein with alkali lignin.

Thus purer products can be produced.

5) In feedstuffs. Lignin-protein complex is non-toxic to cattle and poultry and has no effect on assimilation of protein or other ingredients. Thus lignin-protein complexes can be used as proteinaceous feed supplements.

**Features:** Advantages obtained by removal and recovery of proteins by this method include:

1) Because a definite and stable lignin-protein complex is formed, water-soluble proteins are completely removed from solution.

2) The resultant non-gelatinous flocs serve as nuclei for insoluble proteins and permit rapid separation.

3) Process is very economical: low alkali lignin concentrations give efficient protein precipitation and removal.

4) Separated protein complexes can be recovered efficiently.

**Description:** Evidence for chemical bonding rather than physical coprecipitation is shown by relative solubilities in acetone of lignin and protein. Indulin A (a pure alkali lignin containing 99% organic material) is soluble to 72% in acetone. Wool protein, on the other hand, is insoluble. A complex of Indulin and wool protein is also insoluble in acetone.

Many proteins — egg and

blood albumin, whey protein, etc. — are precipitated following

Here's lignin to

1) Mal slurry lignin in water. D to 6% of ing half er until

2) Add proteinaceous ratio of 1 to 10 parts

3) Mix eral acid 3 to 4. If the floc

4) Hea ing (21

Coagulation temperature ing as possible after promotes agulation.

5) Cool lignin-protein, filter

(Indulin® chemicals Pulp & F A, South

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rotein com-  
covered effi-

vidence for  
rather than  
ipitation is  
solubilities  
n and pro-  
pure alkali  
9% organic  
e to 72% in  
ein, on the  
soluble. A  
n and wool  
soluble in

egg and

CESSING

blood albumin, casein, hemo-  
globin, wheat gluten, and ker-  
atin — are precipitated almost  
quantitatively when using the  
following procedure.

#### How to do it

Here's how to use alkali  
lignin to precipitate proteins.

1) Make a 15% Indulin A  
slurry by dissolving alkali  
lignin in half the required  
water. Dissolve NaOH equal  
to 6% of the lignin in remain-  
ing half of water. Mix togeth-  
er until solution is complete.

2) Add solution above to the  
proteinaceous liquor in the  
ratio of 1 to 5 parts lignin to  
10 parts protein.

3) Mix gently and add min-  
eral acid until the pH reaches  
3 to 4. If the pH drops lower,  
the floc may be improved.

4) Heat to just below boil-  
ing (212°F) to coagulate.  
Coagulation is accelerated by  
temperatures as close to boil-  
ing as possible. An aging peri-  
od after precipitation also  
promotes more complete co-  
agulation.

5) Cool to 130°F and remove  
lignin-protein sludge by set-  
tling, filtering, or centrifuging.

(Indulin® is a product of Poly-  
chemicals Div., West Virginia  
Pulp & Paper Co., Charleston  
A, South Carolina.)

Check 1875 opposite last page.

#### Eight tagged compounds available commercially

Available are eight radio-  
active-tagged compounds.

C<sup>14</sup> compounds — Ascorbic-  
l-C<sup>14</sup>, a vitamin; DL-nor-  
adrenaline-β-C<sup>14</sup>, a pharmaco-  
logic agent; and naphthalene-  
l-C<sup>14</sup>-1-acetic acid, a plant  
hormone.

S<sup>35</sup> compounds — Thiosemi-  
carbazine-S<sup>35</sup>, sulfobromotha-  
lein-S<sup>35</sup>, and disoamylso-  
dium sulfosuccinate-S<sup>35</sup>.

Also available are phospho-  
rus pentasulfide-P<sup>32</sup> and an-  
timony trichloride-Sn<sup>24</sup>.

(Tagged compounds are prod-  
ucts of Volk Radiochemical  
Co., 5412 N. Clark St., Chi-  
cago 40, Ill.)

Check 1876 opposite last page.

## thumbnail portrait

*of the first filteraid to give really satisfactory  
performance in strong alkaline solutions*



The Nerofil Bulletin provides  
more complete information. Just fill  
out the coupon for your copy.

GLC Nerofil



*A processed carbon-base filteraid...the first complete-new type of  
filteraid developed in the past 20 years.*

**Characteristics**—Physically and chemically stable. Practi-  
cally unaffected even by boiling caustic. 30 minute test in 50%  
sodium hydroxide at 125°F. showed no silicon solubility.

**Performance**—Clarity of filtrate excellent. Flowrates compar-  
able to those obtained with many grades of diatomite filteraids, due  
to low density and high porosity of the Nerofil filter cake.

**Special Advantages**—Filter cake is combustible, an  
advantage in metals values recovery. Nerofil does not have the high  
temperature breakdown of cellulosic filteraids, nor the silicon solu-  
bility of diatomite.

**History of Use**—After pilot tests, Nerofil has been adopted  
by, and is being used by, firms engaged in caustic production, sulfur  
production, textile mercerizing, metal plating, metallurgical work,  
the filtration of lignosulfonate liquors and other 'difficult' solutions.

NEROFIL DEPARTMENT,  
Great Lakes Carbon Corporation  
612 So. Flower St., Los Angeles 17, Calif.

Name \_\_\_\_\_  
Position \_\_\_\_\_  
Company \_\_\_\_\_  
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

Check 1877 opposite last page.

# HOW *HERCULES* HELPS...

**PRODUCE STANDOUT PACKAGES**—A long list of Hercules chemicals helps to make better boxes, bags, and cartons for stores and industry. Hi-fax®, Hercules' new type polyethylene, wet-strength resins, fortified size, wax emulsions, and ethyl cellulose hot-melt adhesives, all contribute importantly to improved packaging. Hercules® CMC used in paper making results in better gloss printing with less ink. In the inks themselves, Vinsol®, Poly-pale®, and other Hercules resins are used to meet specific printing requirements.

**MAKE FOODS TASTE BETTER**—In the modern, well-equipped kitchens at the Hercules Research Center, trained food technologists continually work with processors to determine proper use levels for the complete line of flavoring agents, taste intensifiers, and meat tenderizers produced by Huron Milling Division.



**KEEP CATTLE HEALTHIER**—Ticks, horn flies, stable flies, and other insect pests keep beef cattle from putting on weight. Livestock spray formulations based on toxaphene insecticide control these pests, are approved by the USDA, and meet the rigid specifications of the Food and Drug Administration.

*HERCULES*

**HERCULES POWDER COMPANY**

900 Market St., Wilmington 99, Delaware

CHEMICAL MATERIALS FOR INDUSTRY



007-9

## CHEMICAL MATERIALS

**Chromyl chloride has high purity, lower price**

Produced by new process

**Uses:** For carrying out homogeneous organic oxidations and chlorinations; for manufacture of coordination compounds of trivalent chromium; as potential intermediate for preparation of various organic compounds of chromium, including aryl chromiums and organic chromates.

**Features:** Because of its high purity, material is completely stable and non-corrosive to most metals as long as light and moisture are excluded. Price has been reduced to about one-third of original offering.

**Description:** Material is mobile red liquid nearly twice as heavy as water, and boils without decomposition at 116°C. It has low dielectric constant and conductivity, and freezing point of -96°C. Principal impurities are traces of Cl and SO<sub>2</sub>. Process for production of chromyl chloride is described in US Patent 2,793,937.

(Chromyl chloride is a product of Mutual Chemicals, Allied Chemical & Dye Corp. Baltimore 31, Md.)

Check 1879 opposite last page.

**Darker, cleaner impression with carbon ink wax for typewriters**

**Uses:** For typewriter carbon paper inks as complete replacement for either carnauba or ouricury wax.

**Features:** When properly formulated, material provides darker, cleaner impression with minimum of roller marking during typing.

**Description:** Domestic microcrystalline wax has good retention of oil and is dependable solvent for dyes.

(WB-5 wax is product of Bareco Wax Co., Dept. C7, PO Box 2009, Tulsa, Okla.)

Check 1880 opposite last page.

Check 1878 opposite last page

# Now available

**NEW 48-page booklet containing  
comprehensive data on the properties  
and uses of the versatile,  
high-molecular-weight polymer, PVP**

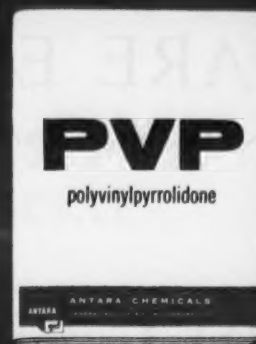
## PROPERTIES OF PVP

Binder  
Stabilizer  
Detoxifier  
Disperser  
Film-former  
Complexing agent  
Physiologically acceptable

## INDUSTRIAL USES OF PVP

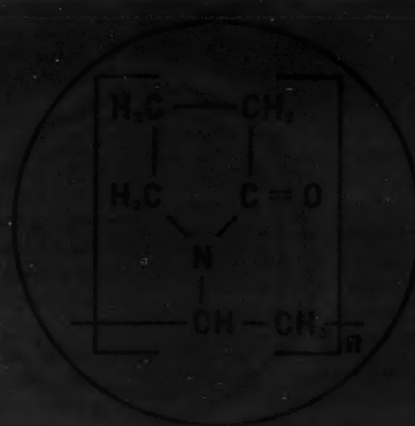
Cosmetics  
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Plastics  
Graphic arts  
Protective coatings  
Beverage clarification  
Agricultural chemicals

Send in the coupon and receive this valuable  
booklet free of obligation.



# PVP

(polyvinylpyrrolidone)



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**ANTARA CHEMICALS**  
A SALES DIVISION OF  
GENERAL ANILINE & FILM CORPORATION  
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Acetylene Chemicals Department  
Antara Chemicals  
435 Hudson Street, New York 14, New York

Please send free booklet on PVP to:

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Company \_\_\_\_\_  
Address \_\_\_\_\_

CP-1187

For  
more information  
on product at  
right, specify 1881  
see information  
request blank  
opposite last page.





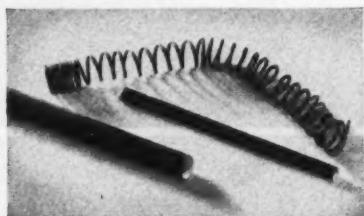
# RARE EARTH RESEARCH

*Recent interesting rare earth research developments*

a report by LINDSAY

We are frequently fascinated by the imagination of researchers who are working with the rare earths. It appears that technical people, observing the many essential uses of rare earth salts in chemical and industrial processes, are looking at these fifteen unique elements as a fertile field for exploration.

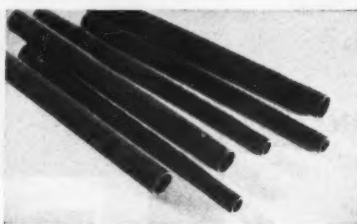
During recent years, rare earths have been accepted as basic chemical tools in a wide cross section of American industry. This suggests that fruitful results may be expected from the rare earth research projects currently being carried on in industrial laboratories and pilot plant operations from coast to coast. Here, for instance, are half a dozen which may interest you.



**MILES OF MISCH.** This isn't a new application, but we're wondering if you know that misch metal (an alloy of the mixed rare earths) is available in wire form as well as in ingot and rod form? Cerium alloys can also be had in powder form; they are used as getters in vacuum tubes. We don't make the metal, but we can put you in touch with those who do.

**FLAME SPRAYING.** A new process for flame spraying various refractory oxides on metallic surfaces has been brought to near completion. Titania, zirconia and alumina can be flame sprayed, but the thing that interests us is that flame sprayed cerium oxide has some unusual properties. Rare earth oxide is a good

heat radiation material, and it seems that metallic surfaces coated with rare earth oxide radiate heat much faster than do untreated surfaces.



**RARE EARTHS IN PLASTICS.** We frankly don't know what sort of things rare earth-impregnated plastics could be used for, but a couple of people have taken enough interest in this problem to make up experimental samples. We've been doing some playing with them ourselves and have some ideas about using them. Polyethylene, for example, can be fabricated to hold up to 5 to 10 times its weight of rare earth oxide, and we've even seen some precision-bore epoxy tubing made with a rare earth oxide filler.

**SEPARATION AND SAMARIUM.** We are like a slaughter house in that we would like to use everything that a rare earth separation process turns out, including the squeal. With the interest that has been generated in using gadolinium as a neutron absorber (thermal cross section about 46,000 barns), we have accumulated quite a pile of samarium oxide in rather decent purity. In the process of separating gadolinium and some of the other rare earths, samarium is produced as a by-product. If you can think of a use for samarium, we have the samarium compounds.

**RARE EARTH GARNETS.** These are structurally somewhat similar to the garnet

variety grossularite (formula  $\text{Ca}_3\text{Al}_2(\text{SiO}_4)_3$ ). The most interesting ones are the rare earth-iron garnets such as  $\text{Y}_3\text{Fe}_2(\text{FeO}_4)_3$ . This mouthful of formula has been abbreviated by researchers to "YIG" for obvious reasons. Other names stem from other rare-earth symbols. These garnets, particularly those of yttrium, gadolinium, erbium, and some others have interesting ferromagnetic properties, making them useful as ferrite materials in electronic equipment. We don't make the garnets, but we do make the rare earth oxides needed to prepare them.

**SINTERED SHAPES.** One of our friends once wanted to know if rare earth oxides could be pressed and sintered into shaped pieces. Apparently they can, and our friend made up some experimental hot-pressed rare earth oxide and cerium oxide pieces for us.



Lindsay produces thorium and rare earth salts in purities up to 99.99% for a rather surprising variety of chemical and industrial applications. Most of these materials are available for prompt shipment in quantities from a gram to a carload.

We will be pleased to supply your research and process development people with technical data, analyses, prices and whatever may be helpful to you in exploring the possibility of the profitable application of rare earths to your own problems.

## CHEMICAL MATERIALS

### Lanolin-in-vehicle for cosmetics, aerosols

**Uses:** In cosmetic creams, lotions, lipsticks, and in aerosol-packaged cosmetic preparations.

**Features:** Product is an effective emollient, plasticizer, and lubricant. In hair lacquers, it eliminates brittleness and flaking in dry weather, yet won't get sticky during wet weather. In lipsticks, it intensifies staining properties, improves spreading.

**Description:** Product is a clear, golden yellow, oily liquid containing about 35% (by wt) of pure lanolin dissolved in a lanolin-derivative vehicle. Price ranges from 70¢/lb in 400-lb containers, up to 90¢/lb (Ethylan is a product of Robinson Wagner Co., Inc., Dept. CP, 110 E. 42nd St., New York 17, N.Y.)

Check 1883 opposite last page.

### Imparts 'self-healing,' soil resistance, gloss to floor polish film

Is also slip-resistant

**Uses:** For manufacture of industrial and household floor polishes.

**Features:** Material imparts "self-healing" properties derived from natural waxes to film of floor polishes. Soil resistance and high gloss of synthetic polymer finishes, as well as extreme toughness and slip resistance, are also added.

**Description:** Emulsifiable polymer is derived from microcrystalline petroleum wax. Its universality makes possible results previously obtainable only by combining a number of different components. Therefore, its use permits manufacturers to reduce inventories both in number and volume.

("Cardis Polymer #8" is product of Warwick Wax Co. Inc., Subsidiary of Sun Chemical Corp., Long Island City, New York.)

Check 1884 opposite last page.



**LINDSAY CHEMICAL COMPANY**

*World's Largest Producer of Thorium and Rare Earth Chemicals*

288 ANN STREET • WEST CHICAGO, ILLINOIS

Check 1882 opposite last page.

**Polyethylene glycol data**

Use, physical properties, specs, and shipping data on three polyethylene glycols are in 2-page bulletin. Polyethylene glycol — Industrial Chemicals Div., Olin Mathieson Chemical Corp., Baltimore 3, Md.

Check 1885 opposite last page.

**Medium-impact styrene has free-flowing and fast set-up qualities**

**Uses:** For production of container parts, switch plates, towel racks, and action-type toys.

**Features:** General-purpose medium-impact polystyrene molding material combines free-flowing characteristics with fast set-up.

**Description:** Rubber-modified polystyrene has a specific gravity of 1.04, tensile strength of 4300 psi, and flexural strength of 6900 psi. Color stability, chemical resistance, and electrical properties are similar to those of rubber-modified high-impact styrenes. However, molding properties are more like those of general purpose compounds.

(TMDA-8020 is product of Bakelite Co., Div. of Union Carbide Corp., 260 Madison Ave., New York 16, N. Y.)

Check 1886 opposite last page.



"You and your 'Let's add just one more drop!'"



# CO<sub>2</sub> restored the flow

## WHEN TAPS SLOWED TO A TRICKLE

A few years ago the water taps in one of our midwestern cities began to flow too gently. City engineers suspected the culprit was excess lime.

In the lime-soda ash process of water treatment it is customary to over-treat the water to assure maximum softening. This causes plugging of the water lines due to precipitation of the excess lime.

### CO<sub>2</sub> SOLVES THE PROBLEM

Recarbonation of the treated water with CO<sub>2</sub> changed the lime to a more soluble form—and water pipes stayed free-flowing. The CO<sub>2</sub> system is successfully solving the lime problem in cities like Minneapolis, Minn., Columbus, Ohio, Eau Claire, Wis. and many other municipalities.

This is just one of hundreds of CO<sub>2</sub> applications that may lead you to a solution to one of your problems.

### IS THERE A JOB FOR CO<sub>2</sub> IN YOUR PLANT?

Almost every day another manufacturer or processing plant finds that carbonic gas can improve the product, simplify an operation, cut cost, or increase safety.

CO<sub>2</sub> is now doing a job in such varied applications as these:

- Curing cores and molds for foundry castings
- Making possible low cost gas shielded welding
- De-flashing molded rubber products quickly at low cost
- Improving paints and varnishes
- Freeze-drying pharmaceuticals
- A low cost, safe, weak acid for neutralizing
- As an inert atmosphere to prevent fire and explosion
- And hundreds of other applications

Some of these may be of direct interest to you, others may be adaptable to your field. If you'd like a broader list, we'll be glad to send you our booklet "CO<sub>2</sub> Applications Unlimited". Just check it on the coupon below. If you'd like detailed technical data on any of the applications listed in this advertisement, check those in the coupon too.

World's Largest Producer of  
**THE LIQUID CARBONIC CORPORATION**  
 Chicago 23, Illinois

- ☐ Curing Cores and Molds
- ☐ Rubber Tumbling
- ☐ Freeze-Drying
- ☐ Gas Shielded Welding
- ☐ Paint and Varnish Manufacture
- ☐ Other \_\_\_\_\_

#### THE LIQUID CARBONIC CORPORATION

3124 South Kedzie Avenue • Chicago 23, Illinois

Please send me a copy of "CO<sub>2</sub> Applications Unlimited" plus detailed information on the indicated uses of CO<sub>2</sub>.

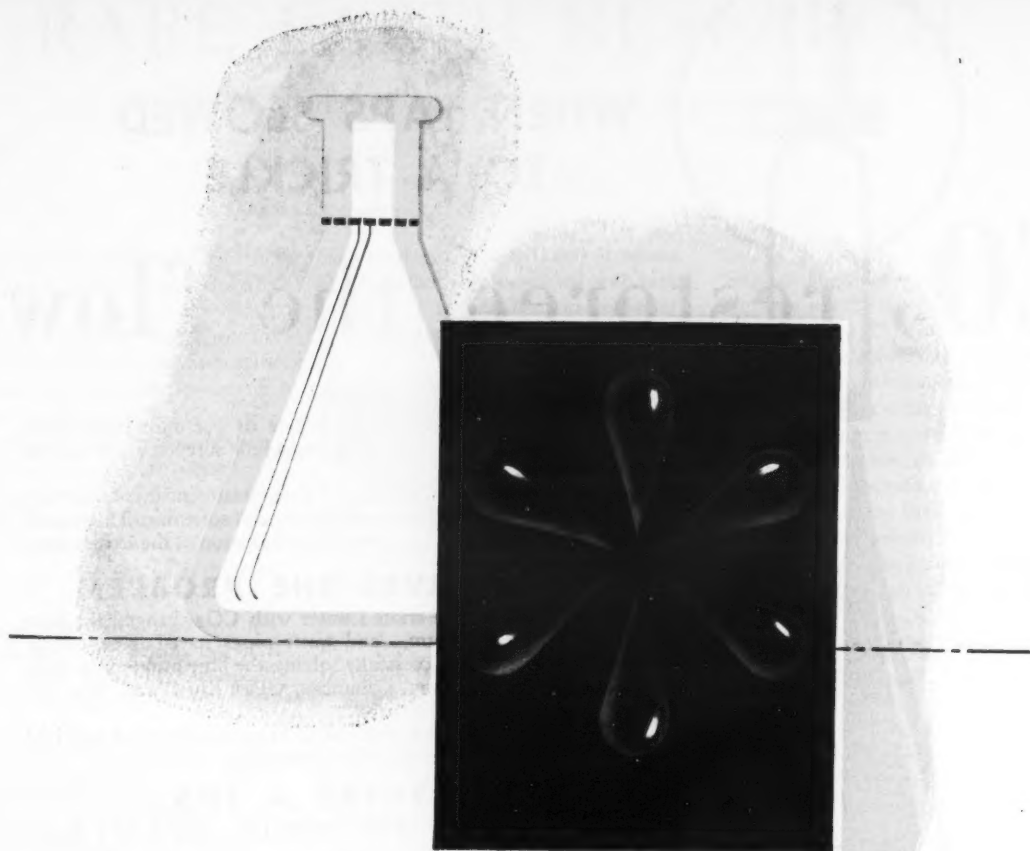
Name \_\_\_\_\_

Title \_\_\_\_\_ Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

Check 1887 opposite last page.



# EAK



...a high-boiling solvent  
of growing importance

In surface coating formulations where active solvents are used, ethyl amyl ketone supplements the basic function of lower boiling ketones such as MEK and MIBK.

EAK has high solvency for surface coating materials, and exhibits superior blush resistance and good diluent tolerance for both aromatics and aliphatics. Its slow evaporation rate contributes to

excellent flowout and prevents pinholing and bubbling in the coating film. Combined with MEK and MIBK, ethyl amyl ketone promotes better flow and gloss, and eliminates dry overspray.

EAK has found steadily increasing use in many popular surface coating formulations. It has been proved valuable in high-low thinners for automotive refinishing lacquers, silk-screen printing

lacquers, and multicolor lacquers, and many types of protective coatings. Cellulose esters, vinyl polymers and copolymers, acrylics, and most synthetic and natural resins are soluble in EAK.

Your Shell Chemical representative will gladly discuss your specific solvent needs with you. Write for *Organic Chemicals*, a catalog of Shell solvents, resins and intermediates.

**SHELL CHEMICAL CORPORATION**  
CHEMICAL SALES DIVISION, 380 Madison Avenue, New York 17, New York

Atlanta • Boston • Chicago • Cleveland • Detroit • Houston • Los Angeles • Newark • New York • San Francisco • St. Louis  
IN CANADA: Chemical Division, Shell Oil Company of Canada, Limited • Montreal • Toronto • Vancouver



Check 1888 opposite last page.

## CHEMICAL MATERIALS

**New surface-active agent  
has super high-foaming  
emollient qualities**

**Uses:** Surface-active agent for shampoos and cosmetics.

**Features:** Agent has exceptional high-foaming and emollient qualities, and great affinity to hair and skin. Even when used undiluted, its affinity imparts a lingering softness to skin and hair in contrast to the drying and degreasing effect of many detergents. It is highly compatible with soap.

**Description:** Surface-active agent is clear, honey-gold, moderately viscous liquid, with a pleasant, faintly spicy natural perfume. It is completely soluble in water, and safe to use in all proportions, and is high-foaming.

("Duponol" XL Surface agent was developed by Dyes and Chemicals Div., E.I. du Pont de Nemours & Co., Wilmington 98, Del.)

Check 1889 opposite last page.

**Catalyst 'masterbatch'  
simplifies fabrication  
of silicone rubber**

**Uses:** As catalyst "masterbatch" for fabrication of silicone rubber.

**Features:** High peroxide ratio greatly reduces fire hazard inherent in working with 100% liquid ditertiary butyl peroxide. It also minimizes the addition of contamination from foreign ingredients during further compounding.

**Description:** Catalyst is made up of Silastic gum, inert fillers, and 20% by weight of ditertiary butyl peroxide. Material is available in one and ten-pound cans, and in 40-pound pails.

(Silastic Catalyst S-2084 is product of Dow Corning Corp., Midland, Mich.)

Check 1890 opposite last page.

For more information on product at right, specify 1891... see information request blank opposite last page.

CHEMICAL PROCESSING



# "It pays to see VICTOR" contest

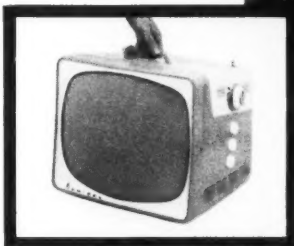
**WIN A 15-DAY  
HAWAIIAN VACATION  
FOR TWO**

**35 other valuable prizes  
Plus . . . bonus prizes!**

## first prize

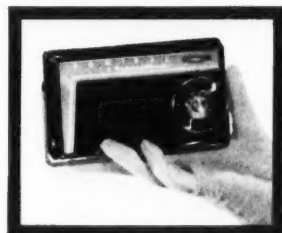
A trip to the spot you've always dreamed about. Fabulous, fabled, romantic Hawaii—the pearl of the Pacific. Home of the hula, Waikiki Beach, beautiful Diamond Head, Pearl Harbor—a land of enchantment. You can have 15 days in the paradise of the Pacific—for two—if you win first prize in the "It Pays To See Victor" Contest. Fly via United Airlines DC-7, Red Carpet service. All traveling and living expenses paid. You select the time you want to go (during 1958). It's fun! It's easy! Read the rules inside . . . enter the contest . . . and you may be the lucky winner who leaves the mainland (and worries) behind for 15 wonderful, carefree days. There's a five-day island cruise included, too!

## 15 second prizes



Admiral portable TV sets with 17-inch screens will be awarded to the 15-second-place winners. Here's an easy way to get that second TV set.

## 20 third prizes



Admiral transistor radios will be given to the 20 third-place winners. These popular, electronic marvels bring entertainment wherever you go.

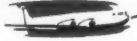









**See inside for contest puzzle, complete rules, and details about bonus prizes!**



from San Francisco to Honolulu (and everywhere)...

It pays to see VICTOR



Two lucky people will board a beautiful, United Airlines Mainliner  after winning first prize in the "It Pays To See Victor" contest. They'll be traveling in style, comfort, safety, and good health, thanks to many Victor  chemicals. Imagine, if you will, how many times they will use, or come in contact with Victor chemicals on their flight to Hawaii. For instance, before they take off, the ground crew refuels and checks the oil in the plane.  Flights are faster because today's engines are lubricated with oils containing additives made with phosphorus pentasulfide. Now, let's look at some of the bright ideas aboard. Aluminum sections, trim, and parts (to save weight),  are in evidence almost everywhere you look. The shiny finish is the result of being bright dipped in a solution containing phosphoric acid. Surprised? Have a seat, and look at the colorful window curtain.  The fabric has probably been made flame resistant by dipping in a solution containing mono-ammonium phosphate. In addition, many fabrics, even clothing  of the passengers and crew, were dyed with the aid of Questex (EDTA—ethylenediamine tetra-acetic acid). Hungry? When the stewardess brings the meal  the dessert could well be a piece of cake . . . made light and tender because the phosphate leavening agent used is sodium acid pyrophosphate. No washing dishes up here, of course, but when they are washed in modern, commercial dish-washing equipment,  they will be spotless and sanitary if the washing compounds contain chlorinated TSP (trisodium phosphate). Lean back and relax.  The pillow case and other individual articles used for personal comfort during the flight have been laundered fresh and clean with a detergent containing sodium tripolyphosphate. Getting anxious? Almost before you can say . . . "It pays to see Victor", the hostess will be saying, "Aloha"!  As you deplane, she smiles, and her beautiful white teeth are evidence that the dentifrice she uses contains dicalcium phosphate. The list of uses of Victor chemicals is endless . . . and when the commercial "jets" begin flying, you can bet that Victor phosphates, formates, and oxalates will be a part of them, too!

VICTOR CHEMICAL WORKS

155 North Wacker Drive, Chicago 6, Illinois

**V VICTOR**  
Dependable Name in  
*Chemicals*  
for 60 Years

You can't pour



\*

but you can P

Are heavy materials a problem in your plant? Graco Powerflo Pumps may provide the answer. These pumps mount on pails or drums... easily spray or extrude thick compounds quickly, get all the material from original container. Rugged eliminate idle or speed up save labor "housekeeping" the Power

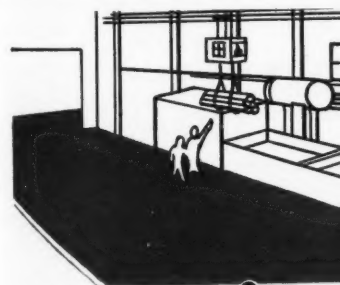
\* Unretouched photo shows five gallon pail of nearly solid sealing material. A Graco Powerflo Pump successfully pumped it out of original container. WRITE FOR DETAILS on Graco Lab test to check pump your materials. Graco lab report furnished without charge.

**GRACO**  
GRAY COMPANY, INC.

Engineers and Manufacturers  
112 Graco Square • Minneapolis 13, Minnesota  
Regional Offices: New York (Long Island City), Philadelphia, Atlanta, Houston, Chicago, San Francisco.

Check 1892 opposite la

**For Acid-Proof**  
in Industrial and Process



**SAUEREISEN**

**Test it Yourself**

Special trial order, 100 lb. lot, only

**\$12**

Here's a revolution that resists acids, salts, and high temperatures. Can be applied as floors. Also recommended for foundations, etc.

We invite your inquiries with

**Sauereisen Cements Co., Inc.**

Check 1893 opposite

NOVEMBER 1957

n't pour it ...



u can PUMP it!

a problem in  
werflo Pumps  
answer. These  
s or drums...  
le thick com-  
the materi-  
ainer.

Rugged Graco Powerflo Pumps  
eliminate messy dispensing by pad-  
dle or scoop. Air powered, they  
speed up production...cut waste...  
save labor...help improve plant  
"housekeeping". Write today for  
the Powerflo catalog.

shows five gallon pail of heavy,  
ing material. A Graco Powerflo  
pumped it out of original pail.  
n Graco Lab test to check pumpability of  
lab report furnished without obligation.



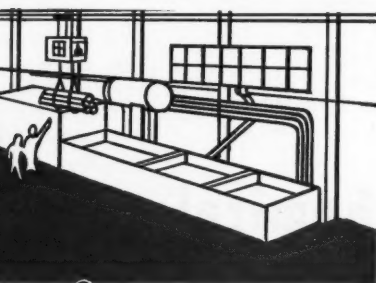
**GRACO**

COMPANY, INC.  
s and Manufacturers  
• Minneapolis 13, Minnesota

k (Long Island City), Philadelphia, Detroit,  
on, Chicago, San Francisco.

ck 1892 opposite last page.

**id-Proof floors**  
al and Processing Plants



**EREISEN No. 54**

Here's a revolutionary Pour-Lay Concrete  
that resists acids, salts, solvents, water, oil  
and high temperatures. May be poured into  
place and leveled off, ready for use in hours.  
Can be applied as a topping over existing  
floors. Also recommended for tanks, pits,  
vats, foundations, sewers, etc.

ite your inquiries without obligation. 54A  
Cements Co., Pittsburgh 15, Pa.

ck 1893 opposite last page.

## CHEMICAL MATERIALS

**Plasticizer for latex  
displays good aging,  
resistance to water**

Uses: As modifier and ex-  
tender for both curing and  
non-curing latex systems.

Features: Emulsion exhibits  
good softening and plasticizing  
properties, and displays good  
aging characteristics and re-  
sistance to water and alkalis.

Description: Latex plasticiz-  
er is an anionic emulsion com-  
patible with natural, neoprene,  
styrene-butadiene, styrene-  
acrylonitrile, and acrylic la-  
texes. It has a particle size  
of 1.0 micron.

(Latex Plasticizer A-12 is  
product of Pennsylvania In-  
dustrial Chemical Corp., Dept.  
CP, Clairton, Pa.)

Check 1894 opposite last page.

### Polyester resins

Booklet of 36 pages (PL-316)  
deals with properties of com-  
pany's Paraplex P-series, in-  
cluding acrylic-modified res-  
in. Reinforcement and fabrica-  
tion are subjects covered in  
16-page second booklet (PL-  
322). Curing is theme of third  
booklet of 24 pages (PL-323).  
Tables and graphs guide users  
in each step of processing.  
Polyester resin booklets —  
Plastics Dept., Rohm & Haas  
Co., Washington Sq., Phila-  
delphia 5, Pa.

Check 1895 opposite last page.

### FOR MORE INFORMATION

Here's what to do when you  
want additional details about  
products and services men-  
tioned in this issue's editorial  
articles or advertisements.

Note the number at end of  
article or advertisement.  
Check this key number on  
Reader Service Slip opposite  
last page of this issue. Fill in  
Slip with the other pertinent  
information (name, title, com-  
pany, address, product made).  
Mail to our Reader Service  
Department.

We'll contact the manufac-  
turer for you. He'll send you  
the details direct.



**INDUSTRIAL  
CHEMICALS**



We mine Copper, Sulfur,  
Iron and Zinc and are basic  
producers of their chemical  
derivatives. Our technical  
know-how and basic position  
in these minerals is your  
assurance of exacting quality  
control, strict uniform consis-  
tency and a plentiful supply.



Samples, specifications  
and detailed  
information available  
upon request.

TENNESSEE



CORPORATION

617-29 Grant Building, Atlanta, Georgia

Check 1896 opposite last page.

### COPPER

#### COPPER SULFATE

Industrial Crystals and all common  
grades.

#### MONOHYDRATED COPPER SULFATE

35% Copper as metallic packaged in  
steel drums at no extra cost.

#### COPPER CARBONATE

55% Copper as metallic. Light and  
dense grades.

#### CUPRIC CHLORIDE

37% Copper as metallic. Available in  
polyethylene-lined drums or bags.

#### CUPRIC OXIDE

Minimum 76% Copper as metallic.  
Technical grade . . . NOT A BY-  
PRODUCT.

### SULFUR

#### SULFURIC ACID

#### LIQUID SULFUR DIOXIDE

Highest commercial quality, available  
in tank cars, tank wagons, ton cylin-  
ders and 150-lb. cylinders.

#### CHLOROSULFONIC ACID

Iron less than 1.0 ppm as loaded.  
Water white. Delivered in glass-lined  
tank wagons, also in stainless steel  
drums.

#### SODIUM HYDROSULFITE

T-C HYDRO is a dry, white, free flow-  
ing, crystalline powder of uniform par-  
ticle size and structure. It is dust free,  
assuring highest stability and uniformity.

#### PARA TOULENE SULFONIC ACID, ANHYDROUS

Other organic Sulfonic Acids.

### IRON

#### FERRIC IRON SULFATE

Partially hydrated, free flowing gran-  
ular form. Available in bags or bulk.

### ZINC

#### MONOHYDRATED ZINC SULFATE

36% Zinc as metallic. White, free  
flowing powder.

#### ZINC OXIDE

Secondary Zinc Oxide.

### MANGANESE

#### MANGANESE SULFATE

65% Mn SO<sub>4</sub>. Designed specifically for  
inclusion in mixed fertilizer.

#### MONOHYDRATED MANGANESE SULFATE

93% Mn SO<sub>4</sub> · H<sub>2</sub>O. Highest purity,  
technical grade . . . NOT A BY-  
PRODUCT.

#### MANGANOUS OXIDE

Minimum 48% Manganese as metallic.  
Feeds, fertilizers, spray or dust grades.





Olin Mathieson photo

How can you be sure that the men you hire have the potential of making good chemical operators? Why not take a tip from US Rubber Company, who use an . . .

## Aptitude test for selecting chemical operators

**H. A. WIEGMANN**  
Personnel Assistant  
US Rubber Company, Joliet Arsenal  
Joliet, Illinois

**P**ersonnel tests designed to screen applicants with potential to develop quickly as skilled chemical production operators can be the key to reduced costs and improved product quality. Such a testing system has been found to be successful at the

United States Rubber Company, contractor-operator of the Kankakee Unit, Joliet Arsenal, Joliet, Illinois, where it has been in use for over 18 months. Plant produces TNT and other explosives for the government.

Need for effective job placement of applicants with little or no comparable industrial experience led company into developing test. Since put into use, test has aided significantly in cutting training time, stabilizing product quality, and reducing turnover.

### Developing The Test

The first step in developing the test was to review job classifications of TNT production workers. Jobs were grouped into four categories; material handlers, refining and purification operators, chemical operators, and key operators. Employees were observed on the job, and several workers from each group were interviewed to obtain specific skills used on the job.

Job analysis showed that ap-

plicants are considered only for starting jobs in the material handling group. Selected applicants are assigned to an experienced employee for on-the-job training. Promotion may be achieved within material handling to purification and refining or to the chemical operator category.

The chemical operator is the core around which the TNT production crew is built. Operators are expected to display a high degree of skill. Ability to develop

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**IDEAS:** from other industries and nuclear field . . . new trends in research, processes, services

this skill is main factor in selecting applicants. Supervisors do not expect to obtain employees with developed skills and must depend on persons who can achieve maximum benefits from training. Successful applicants for production jobs in the TNT department are required to:

- 1) Have a capacity for learning equal to that normally required to complete high school.
- 2) Perform simple addition and subtraction problems quickly.
- 3) Observe material in process and judge proper time to begin succeeding phase of operation.
- 4) Understand pipe and valve systems.

#### Test Construction

To appraise applicant's abilities in the area listed above, six types of questions or test items were developed:

- 1) General information items to indicate mental alertness and ability to retain knowledge.
- 2) Vocabulary items to measure mental abilities, since vocabulary has a high correlation with intelligence.
- 3) Arithmetic reasoning items to measure ability to understand instructions and perform basic arithmetic functions.
- 4) Number series problems to measure ability to reason and work systematically.
- 5) Block-counting items to measure spatial perception, since operators are required to perceive changes in materials in process and to visualize the complete process.
- 6) Mechanical comprehension problems to measure understanding of basic principles of mechanics, a prerequisite to understanding pipe and valve systems and manufacturing process.

Twenty questions of each type were prepared and set up into separate sub-tests. Because previous studies showed that high school-caliber personnel had worked out better as operators, the experimental version of the

test was given to a class of high school seniors. Test scores and individual answers were analyzed, and the 50 most effective items were arranged into a revised test.

#### Test Evaluation

Test was administered to additional groups of high school students and then to 155 TNT production employees. Average

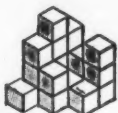
*To next page*

1. HOT means the same as or opposite of: ..... (—)  
(a) temper (b) tepid (c) torrid (d) tamale



2. How many blocks visible to you are not shaded? ..... (—)

3. A HYDROMETER is used to: ..... (—)  
(a) measure specific gravity of liquids  
(b) measure water temperature  
(c) measure water power  
(d) measure the quantity of liquids in a jar



4. How many blocks have only their top surface visible ..... (—)

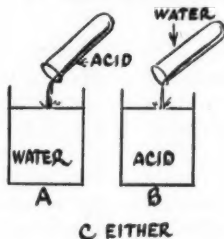
5. TNT boxes are purchased at a price of three for \$1.00. How much will 1 1/2 dozen boxes cost? ..... (—)



6. Water in a glass tube will have a top surface like that illustrated in figure ..... (—)

7. What is the next NUMBER in the following series: ..... (—)  
12 14 12 10 12 10 8 ? (a) 12 (b) 14 (c) 16 (d) 10

8. CONFORM means the same as or opposite of: ..... (—)  
(a) please (b) assist (c) contradict (d) satisfy



9. Which is the correct way to pour? ..... (—)

10. If 12 revolutions of the flaker drum will crystalize and flake 60 pounds of TNT, how long will it take to crystalize and flake 2000 pounds with the drum traveling at a rate of 10 revolutions per minute? .....

Could you qualify as a chemical operator? Here are some sample questions from the US Rubber test that should give you a fairly good indication. Time allowed: 3 minutes. Passing grade: 6 correct. Answers are on page 302

Test Score	Marginal Operators	Proficient Operators	Total
21 and above	10	44	54 64%
20 and below	13	18	31 36%
Total	23 27%	62 73%	85 100%

Results of tests given to 85 chemical operators. If test had been in effect when these men were hired, 31 (or 36%) would not have gotten the job, since passing grade is 21

## Aptitude Test

From preceding page

score for latter group was 20.4 correct, slightly below average of high school students. Previous results had shown that any person who achieves a score of 22 correct has about the same ability as an average high school graduate. Test can be given in 15 minutes.

Additional analysis proved test to be sound basis for selecting men most likely to succeed in chemical and key operator jobs. Average scores were computed for each of the four job classifications:

Category	Average Score
Material Handler	18.4
Purification Group	19.0
Chemical Operators	22.9
Key Operators	24.4

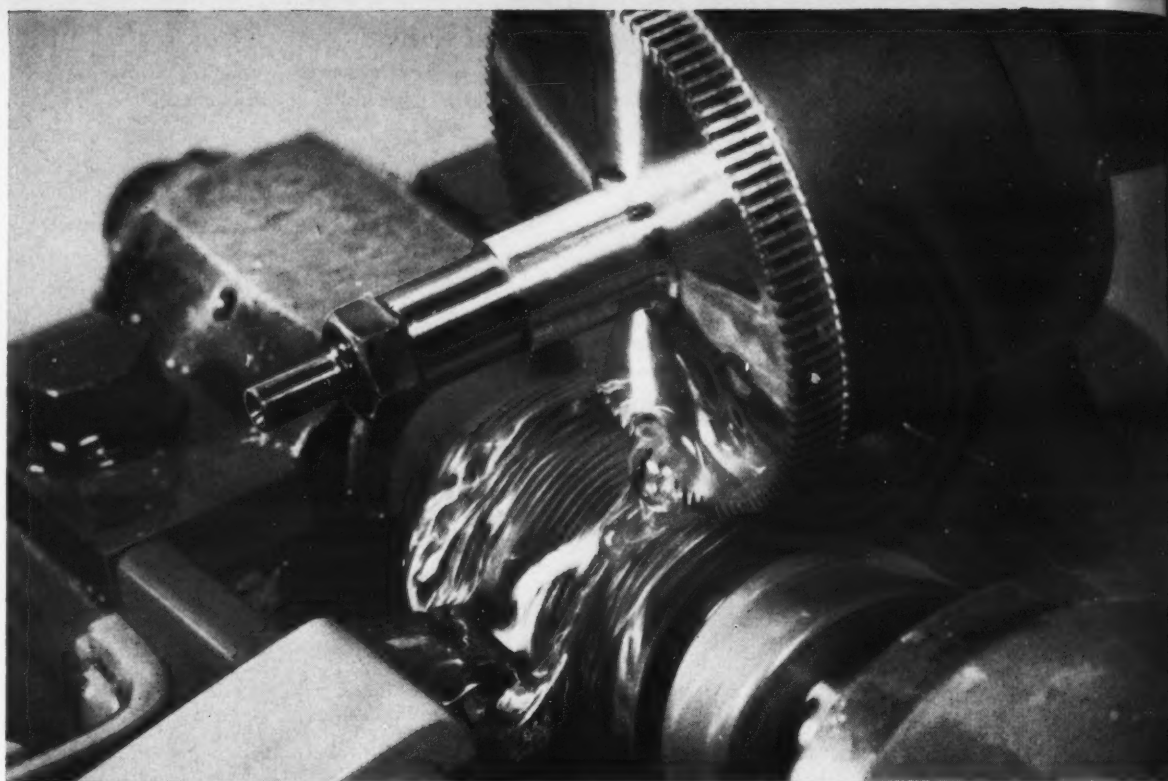
Further analyses were conducted to formulate hiring policies for various production needs. During periods of peak production, two cutting scores could be used. Applicants scoring below 18 would be eliminated. Scores above 17 and below 21 indicate a potential for material handling or purification operator positions. Applicants scoring 21 or above could be hired directly as operator-trainees, avoiding expense and delay of routing them through lower classification jobs for training.

During periods of limited production, only those scoring 21 or higher would be hired to provide a basic work force, all capable of added responsibilities in event of expansion.

(Sample of test may be obtained by writing to the Personnel Division, US Rubber Company, PO Box 871, Joliet, Illinois. Supplies are limited.)

## Stable radioisotopes

Ranges of enrichments and prices of stable isotopes are contained in 70-page loose leaf catalog and price list. Catalog and price list, 1957 — Union Carbide Nuclear Company, Oak Ridge National Laboratory, Dept. CP, PO Box X, Oak Ridge, Tenn. Check 1897.



Exceptional lubricating properties make sperm oil an essential ingredient in high quality cutting oils for precision machining.

# Industry Rediscovered Finest Lubricant

If you have high speed, high temperature industrial lubricating problems... or need a lubricant which plates out to give a strong and continuous film on metallic surfaces... ADM Sperm oils are of interest to you. In addition, they meet the needs for a lubricant with an affinity for metallic surfaces and scarcely change viscosity through wide extremes of temperature.

Sperm oil is remarkable because it is largely made up of the higher fatty alcohol esters of the higher fatty acids.

It resists oxidation and is non-corrosive. Sperm oil's unsaturation is practically all mono-unsaturation. Each molecule of the ester contains but one double bond in each of the fatty acid and alcohol parts of the ester.

45° (N. W.) and 38° (N. W.)

Two particularly interesting ADM sperm oils are ADM 45° (N.W.) and ADM 38° (N.W.) Sperm oil. The temperatures refer to maximum cloud point, or degrees F. at which first signs of cloudiness appear.

Both these oils are pressed, pale yellow

liquids. Sperm oils are among the most stable, naturally derived oils. They resist decomposition even when heated up into the 400-500° F. range. They have a pour point about 2° below their cloud points. Below the pour point they remain in a semi-solid state down to extremely low temperatures.

## Sulfurized Easily

ADM's Natural Winter Sperm oils are sulfurized easily, making them especially fine as boundary lubricants, cutting oils, extreme pressure lubricants, crank case oils, and gear lubricants.

Many other problems... for example, leather treating, bimetal lubrication, rust prevention, and metal stamping... find new, better solutions in ADM Sperm oils. Chances are you can use sperm oil profitably in your business, too. Perhaps Archer-Daniels-Midland, the world's largest and oldest processor and supplier of sperm oil can help you. Write today for 18-page bulletin which gives more facts plus locations of technical sales personnel nearest you. Ask for Bulletin 904A.

## Why sur Laur

A good man  
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OTHER ADM P  
and Natural Res  
Foundry Binder  
Alfalfa, Livestoc



## Why you can make better surfactants with ADM's Lauryl and Myristyl Adols

A good many people who have an interest in surface active agents feel a fondness for ADM's line of lauryl and myristyl alcohols . . . tradenamed Adols. They use them for anionic surfactants and cationic quaternary germicides and surfactants.

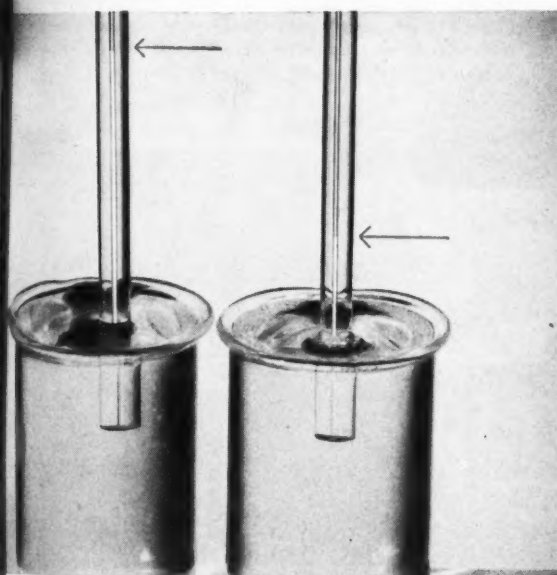
Some of the most often mentioned reasons for repeat orders on Adols include:

- Exceptional water solubility of finished products.
- More stable products than petroleum derivatives provide.
- Most desirable surface tension characteristics.
- Smaller bubbles than similar compounds made from petroleum derivatives.

Adols in the  $C_{12}$  to  $C_{16}$  chain lengths neither volatilize nor have as much odor as the short chains do. They are softer and easier to use than the longer chain lengths, have excellent emollient features, and have optimum surface active characteristics.

ADM's Adols are particularly noted for their freedom from traces of hydrocarbons because of unique production methods.

When you want a reliable source . . . or when you need special help on surfactant problems . . . call on ADM for the most complete line of lauryl and myristyl alcohols available.



Macro-photo shows how ADM sulfonated lauryl alcohols affect surface tension. Surfactant made from Adol 14 has been added to water in beaker at right. Dramatic reduction in capillary rise shows why ADM lauryl alcohols are chosen for surfactants where maximum surface active characteristics are desired.

OTHER ADM PRODUCTS: Linseed, Soybean and Marine Oils, Paint Vehicles, Synthetic and Natural Resins, Vinyl Plasticizers, Fatty Acids and Alcohols, Hydrogenated Glycerides, Foundry Binders, Industrial Cereals, Vegetable Proteins, Wheat Flour, Dehydrated Alfalfa, Livestock, Poultry Feeds, Olefins and Hydrocarbons.

**Chemifats** from Nature's Wondrous Warehouse

The  
Research Chemists'  
Corner



A glass ball and socket arrangement like the one shown here speeds vacuum distillation by making set-ups quick and easy. It gives an excellent stirring connection which in the ADM research laboratory has been used even at .05 mm Mercury vacuum. The ground glass seat fits better as it wears and the ball and socket type of bearing not only runs more freely than other types, but also has a "universal joint" type of flexibility which permits the motor to be slightly off center.

ADM researchers now assemble it from standard taper connections, and find it works with either a metal or glass stirrer. They use a dab of Admex 710 (an ADM plasticizer) to seal and lubricate the joint. Equipment can be set up in a jiffy—even without rubber connections by using glass-to-glass seal or special cement.



### Further notes on Alpha Olefins

Even though alpha olefins have been around long enough to get into commercial production, many people still haven't had a chance to get acquainted with them. A few more words in their behalf seem fitting.

Areas in which alpha olefins stir up interest are so varied that these highly reactive chemicals almost sound like a cure-all remedy. They aren't. But they are startling new building blocks, both for chemical intermediates and as reactants to modify existing products.

Consider them if you are involved with viscosity index improvers, pour-point depressants, detergents, lead scavengers, leather treating, textile and paper chemicals, adhesives, plastics, polymers, or protective coatings . . . just to name a few.

Here's why: Straight-chain  $C_{12}$  to  $C_{16}$  olefins with the unsaturation between the 1 and 2 carbon atoms come from the dehydration of purified fatty alcohols of known composition and chain length. They attain final purities better than 90%. These slender, straight molecules have remarkable metal-wetting properties. They form completely different products than olefins with side chains previously available. They generally react smoothly because of their known structure. When reacted, their derivatives are more stable against oxidation than those of the branched chain (petroleum-derived) olefins. They resist break-down under shear.

There's much more you should know about alpha olefins. Write us. We can send literature, data sheets . . . perhaps even a sample to evaluate.

**Archer-  
Daniels-  
Midland**

CHEMICAL PRODUCTS DIVISION

742 Investors Building  
Minneapolis 2, Minnesota



## IDEAS

### Calibrated gamma sources permanently sealed in lucite holders

Six sources of calibrated gamma reference standards—cobalt-57, barium-133, cesium-137, manganese-54, sodium-22, and cobalt-60—are available for use with all types of gamma sensitive detectors in qualitative and



Set of gamma sources are enclosed in sturdy carrying case

quantitative studies. Quantity of isotope has been adjusted to yield about 50,000-100,000 cpm above 20 KEV with activity less than 0.1 microcurie. Each source is permanently sealed in cylindrical lucite sample holder 5" in length and 5/8" in diameter.

(Calibrated gamma reference standards are available from Baird-Atomic, Inc., 33 University Rd., Cambridge 38, Massachusetts.)

Check 1898A opp. last page.

### Sales supervisor training

Publication of 103 pages is practical guide to training and development of first-line sales supervisor. How to spot, select, and train sales supervisors, and create an effective program for developing sales personnel are discussed. To obtain Special Report 19, remit \$3.75 (AMA members \$2.50) direct to American Management Association, 1515 Broadway, Times Square, New York 36, New York.

Check 1898 opposite last page.

**Polymers cross-linked quickly, efficiently, by ultraviolet rays**

Cost of equipment, treatment is almost insignificant

Considerable interest has been shown recently in the cross-linking of long-chain polymers by physical means. Although most of the work has been done by means of ionizing radiation (gamma rays, high energy electrons, etc.) experiments conducted at the Polytechnic Institute of Brooklyn, indicate that the same or even better results can be obtained with far ultraviolet light (wave-lengths between 200-300  $\mu$ ) at only a fraction of the cost.

Most of the studies were made with polyethylene. Considerable success, however, was also obtained with other polymers including polymethylmethacrylate, polyisobutylene, and polypropylene.

**UV Lamp Costs \$10**

Cost of the treatment is insignificant. For example, the lamp plus the electrical fixture (a 15-watt GE germicidal lamp) cost only \$10. Life of the lamp is quite long and it requires no maintenance. The light produced is harmless as long as eyes are protected by ordinary eye glasses.

In order to enhance absorption of the active radiation, various substances such as dibenzyl disulfide, diphenylamine, p-tolyl ketone, and benzophenone were introduced into the polymers. It was found that these agents acted as sensitizers and reduced the time of irradiation necessary for cross-linking by a factor of 5000, in some cases.

**Irradiation Time**

Normally, 3-5 minutes of irradiation of sensitized (with p-tolyl ketone) polyethylene (5 mils thick) at a distance of 6" from the lamp cross-linked the plastic to the level achieved in Irrathene (General Electric's irradiated polyethylene).

Using a Hanovia type-LL low-pressure mercury lamp, cross-linking of the sensitized

## SEE HOW SOUTHERN NITROGEN USED ALCOA ALUMINUM TO BAN CORROSION

Southern Nitrogen Corporation, the South's newest nitrate fertilizer producer, recently completed a \$14-million plant near Savannah, Georgia. Nearly everywhere you look in this modern processing operation you see ALCOA® Aluminum (over 500,000 lbs) at work to combat corrosion. The photographs on these pages show a few of the many ways it is used there.

It's easy to see why Southern Nitrogen used so much ALCOA Aluminum. No other metal provides so many valuable benefits for such a wide variety of uses. And ALCOA, alone, can offer unparalleled technical assistance based on over 30 years' experience applying all these aluminum advantages in the process industries:

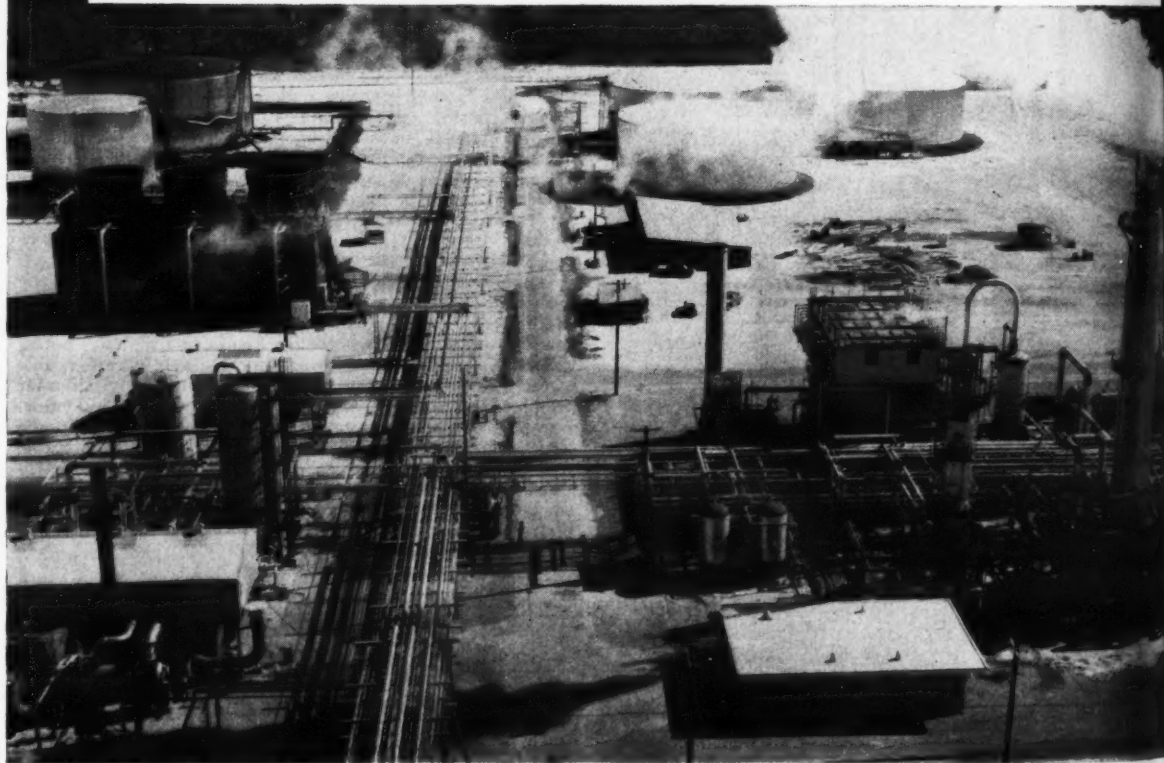
- *Excellent corrosion resistance* extends service life and reduces maintenance to a minimum.
- *Light weight—high strength* make handling easy and economical . . . often permit substantial construction economies.

- *High thermal conductivity* combined with corrosion resistance often makes aluminum the lowest cost material suitable for many demanding heat transfer operations.

- *Nonsparking! • Nonmagnetic! • High reflectivity!*
- *Excellent electrical conductivity!*

The plant designers, The Girdler Company, made full use of all the advantages of working with ALCOA. They were able to employ the unequalled aluminum experience of ALCOA engineers . . . to help them choose the right aluminum alloys and fabrication methods for dependable, corrosion-free service in every part of the plant.

When you have a metal problem, call on ALCOA to find a sound, economical aluminum answer. Consult the nearby ALCOA sales office listed in the Yellow Pages of your telephone directory. Or outline your metal needs in a letter to ALUMINUM COMPANY OF AMERICA, 902-L Alcoa Building, Pittsburgh 19, Pa.



The Girdler Company designed this huge new nitrate fertilizer plant for Southern Nitrogen Corporation. The plant is designed for annual production of 120,450 tons of ammonium nitrate fertilizer, 91,250 tons of nitric acid, 10,950 tons of urea and 328,500 tons of fertilizer solutions.



SION

corrosion  
lowest cost  
heat trans-

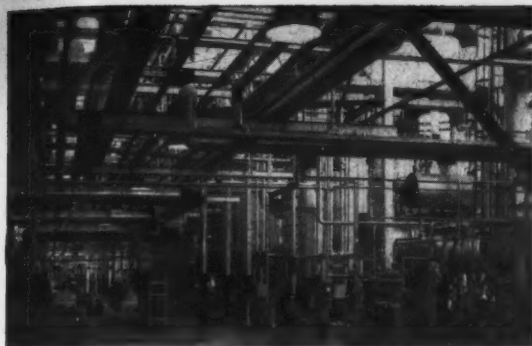
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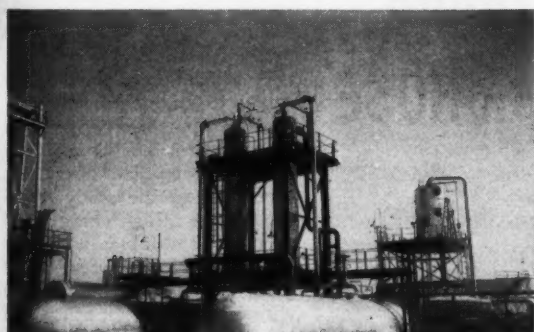
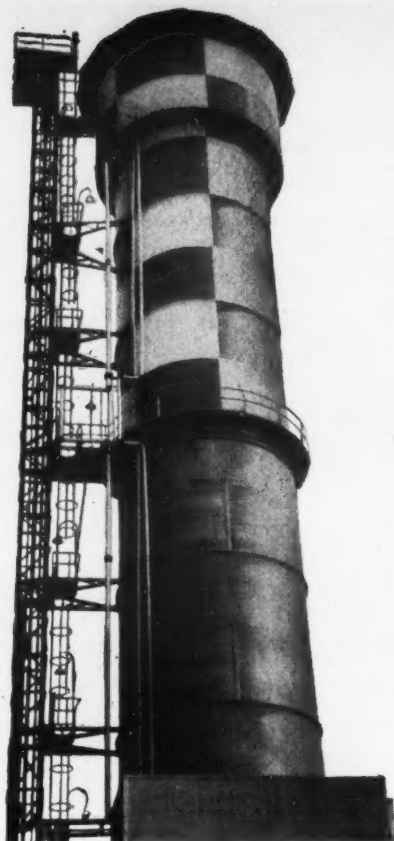


Plant employs thousands of feet of Alcoa Aluminum piping and conduit and is liberally painted with highly reflective aluminum coatings.

These 1,650,000 gallon storage tanks of Alcoa Aluminum alloy 5052 successfully fight the corrosive action of 85% ammonium nitrate. The tanks, 94 ft in diameter by 32 ft high, were built by Chicago Bridge & Iron Co.

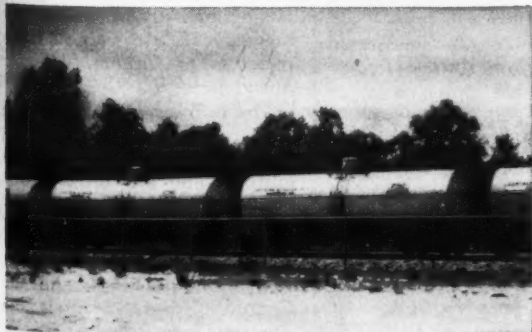


Corrosion-resistant Alcoa Aluminum (alloy 6061-T6) was used throughout this prilling tower . . . to prolong service life without frequent, costly maintenance shutdowns. Built by The Steel Products Co., Inc., Savannah.

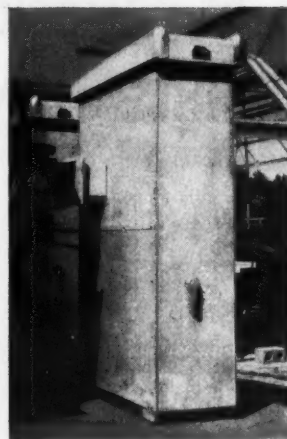


Alcoa Aluminum in these ammonia absorber coolers prevents corrosion while providing constantly high heat transfer efficiency. Coolers built by Henry Vogt Machine Co.

The superior corrosion resistance of Alcoa Aluminum in tank cars prolongs service life and prevents product contamination. Tanks built by Graver Tank & Mfg. Co., Inc. for Union Tank Car Co.



Lightweight gratings of Alcoa Aluminum are used in traffic areas throughout the Southern Nitrogen plant. They stand up under heavy traffic and easily withstand the attack of corrosive industrial atmospheres.



Alcoa Aluminum in electrical bus bar, conduit, fixtures and enclosures gives Southern Nitrogen effective protection from electrical breakdowns during prolonged exposure to corrosive industrial atmospheres.

 **NEW!**  
**"ALCOA THEATRE"**  
Exciting Adventure  
Alternate Monday Evenings



## IDEAS

polyethylene film was achieved in 20 seconds at a distance of 7". At 2", cross-linking of 150 square inches of film was achieved in 5 seconds. If irradiation took place on both sides (using 2 lamps) the time was reduced by factor of 2. Still shorter times are obtained if lamp is in the form of a helix and surrounds the object (e.g. coated electric wire).

### Penetration

For low-density polyethylenes, the useful penetration distance is about 100 mils. Highly crystalline polyethylenes scatter light considerably and the useful penetration thickness is about 10 mils.

Much greater penetration can be achieved if sample is in the molten state. Under these conditions the ultraviolet cross-linking takes place in about the same time as it does for the solid material, but penetration is considerably greater.

### Advantages

The UV method has obvious advantages over the ionizing radiation method in that large areas (as for films) and various shapes can be easily treated. Cost of installation is at least 10,000 times less than that for an ionizing radiation source of the same power.

In both cases, about 10 calories of energy must be absorbed per gram of low density polyethylene to give good cross-linking.

### Safe to Use

UV lamps are safe to operate while with ionizing radiation sources the dosages required for cross-linking are a million times the lethal dosage for humans. The UV method suffers, however, in that it is not applicable to polyethylenes containing carbon black or to very thick samples into which gamma rays readily penetrate.

(Based on series of papers presented by Professor Gerald Oster, Dept. of Chemistry, Polytechnic Institute of Brooklyn, 99 Livingston St., Brooklyn 1, New York.)

Check 1899 opposite last page.





## For extremes of corrosion and temperature specify R/M FLEXIBLE THIN-WALL *Teflon* HOSE

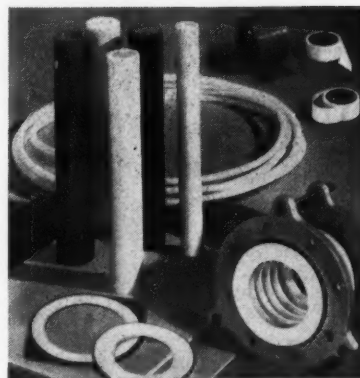
Hundreds of applications prove that in critical fluid services nothing does the job like R/M Flexible Thin-Wall "Teflon" Hose. It is completely impervious to all known industrial acids, caustics and solvents. It is noncontaminating, has zero water absorption, and its unique slippery surface resists adhesion to most materials, reduces pressure drop to a minimum. Designed for continuous service from  $-100^{\circ}$  to  $+400^{\circ}\text{F}$  and under pressures up to 1500 psi.

R/M "Teflon" Hose is produced in a wide range of inside diameters and

wall thicknesses and in both wire-braided and rubber-covered forms. Write us for Bulletin 6700 and feel free to call on us for help in solving your hose problems.

Other R/M "Teflon" products for the chemical industry include rods, sheets, tubes and tape; centerless ground rods held to very close tolerances; bondable sheets and tape; stress-relieved molded rods and tubes; mechanical packings and gaskets; expansion joints and flexible couplings; Raylon—R/M trade name for mechanical grade "Teflon"—having many characteristics of virgin "Teflon."

\*A Du Pont trademark



# RAYBESTOS-MANHATTAN, INC.

## PLASTIC PRODUCTS DIVISION, MANHEIM, PA.

FACTORIES: Manheim, Pa.; Paramount, Calif.; Bridgeport, Conn.; No. Charleston, S.C.; Passaic, N.J.; Neenah, Wis.; Crawfordsville, Ind.; Peterborough, Ontario, Canada

RAYBESTOS-MANHATTAN, INC., Engineered Plastics • Asbestos Textiles • Mechanical Packings • Industrial Rubber • Sintered Metal Products • Rubber Covered Equipment  
Abrasive and Diamond Wheels • Brake Linings • Brake Blocks • Clutch Facings • Laundry Pads and Covers • Industrial Adhesives • Bowling Balls

Check 1900 opposite last page.

### IDEAS

**The American engineer —  
subject of personality  
profile study**

Above-average mentally, but  
is definitely 'middle-brow'

Currently one of industry's most sought-after resources, the American engineer, has been made the subject of a comprehensive study that profiles his personality. Compiled by consultants in the technical manpower field, the study provides the first detailed portrait of the engineer as a man and as a professional.

Although the engineer has above-average mental ability, the study shows this intelligence is restricted to a particular field or specialization. Personality tests reveal the engineer has paid for his devotion to mechanical and impersonal matters at the expense of his development as a social being.

He applies less intelligence to human relations than he does to technical matters, shows little interest in social sciences, public affairs, or even those aspects of physical science which don't immediately relate to engineering.

As employees, engineers tend to work most comfortably with minimum supervision, according to the study. Engineers have a high energy level and are able to stay with their work over long periods of time. They respond to pressure with increased exertion and have independent attitudes toward their work.

As for his leisure-time tastes, the study reveals that the engineer is definitely middle-brow. He likes dancing, movies, and spectator sports. His hobbies are predominantly mechanical. He rarely takes interest in drama, art, or music.

These interest patterns are also reflected in his reading habits. The engineer avoids cultural and low-brow publications in favor of mass-circulation magazines and, of course, technical journals.

(To obtain "A Profile of the Engineer", remit \$7.50 to Industrial News Relations, 230 W. 41st St., New York 36, N.Y.)

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### Uranium

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**Continuous process  
removes 90% sulfur  
from iron**

Research on desulfurization of iron for Diamond Alkali Company, Cleveland, Ohio, has resulted in development of new process reported to achieve 90% reductions in sulfur content. In the process, molten iron and caustic soda are fed continuously into an apparatus where desulfurization occurs as materials are intermixed. Desulfurized metal and caustic slag flow continuously from the apparatus into molds or ladles.

Introduction of a jet of oxygen into mixing chamber makes it possible to remove substantial amounts of silicon at same time sulfur content is being reduced.

Desulfurization occurs rapidly because thin layers of reacting materials are used. Samples taken during heats at pilot-plant laboratory show that sulfur-removal reactions after addition of caustic soda require less than one minute for completion. Large quantities of iron can be treated in unit requiring relatively small space.

Because of low final sulfur content, process holds promise for use in production of ductile cast iron as well as in desulfurization of pig iron prior to conversion into steel.

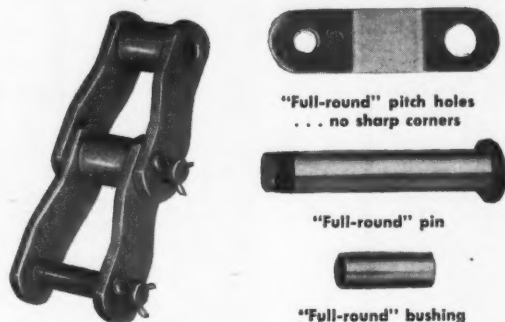
(Desulfurization process was developed by Battelle Institute, Dept. CP, 505 King Ave., Columbus 1, Ohio.)

**Uranium prospecting?**

Pocket-size handbook for uranium prospectors contains enlarged section on geologic occurrence of uranium. Revised handbook also includes information on domestic uranium procurement program, latest AEC uranium price circulars, and up-to-date compilation of laws and regulations affecting uranium mining. To obtain "Prospecting for Uranium", remit 75c direct to United States Government Printing Office, Washington, District of Columbia.

# "Stress raisers" eliminated by Link-Belt LXS chain design

## LXS "FULL-ROUND" DESIGN



**"FULL-ROUND" DESIGN** eliminates stress concentration points. Heat treatment of all parts adds even greater strength and extra wear life to selected steels. Accurate control of these processes avoids brittleness, poor wear values and low tensile strengths . . . and assures uniformity.

## Large pins, bushings mean ample live bearing area for long life

For long life under severe conveyor and drive conditions, Link-Belt LXS chain provides extra strength, increased wear resistance and wider application flexibility. This fabricated steel roller chain incorporates many advanced design and manufacturing refinements, resulting in superior ruggedness and accuracy.

### Eliminate weak points

"Full-round" design does away with stress concentration points most frequently subject to failure . . . provides maximum live bearing area between pin, bushing and sidebars. As a result, stress is distributed evenly, increasing chain life.

Pins and bushings are accurately sized for controlled press fit, preventing rotation in sidebars. Made from selected bar steel, sidebars are

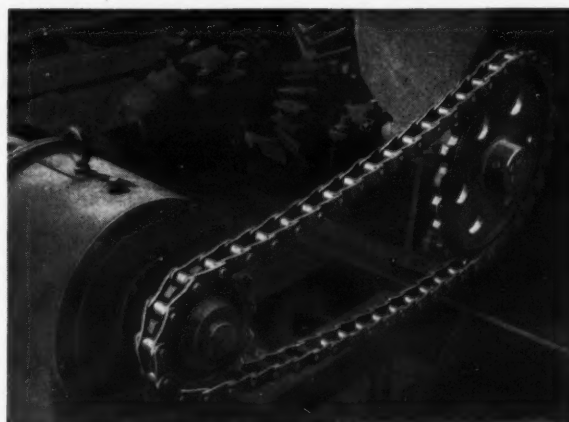
carefully machined for proper pitch hole size and for maintaining firm, tight press fit of pins and bushings. This assures close control of pitch and proper chain length after assembly.

### Hardening extends life

Another Link-Belt long-life extra is the controlled hardening of selected steels used in the manufacture of LXS chain. Pins, for example, are made from a tough steel, specially treated for high strength in shear and for maximum wear value. Bushings are properly hardened to shrug off shock and resist wear.

Rollers are accurately machined to assure proper operating clearances and free-rolling action. Controlled hardening gives them the necessary resiliency and durability.

## LXS especially popular for exposed drives, high impacts



## LXS chain provides extra strength, wear-life for heavy-duty conveying

Link-Belt LXS chain has real stamina—as shown in this conveyor application for handling 1000-pound, 40-foot lengths of steel pipe. Thanks to accuracy of pitch and at-

tachment spacing, plus close matching of multiple strands, LXS has the added strength and wear life for the extra-long conveyors so popular in today's move to mechanization.

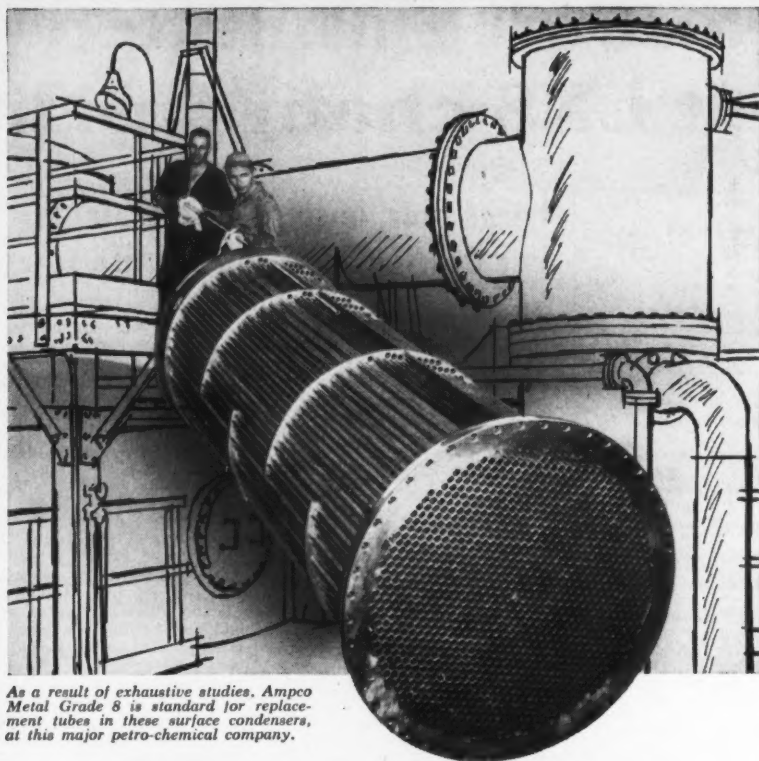
HEADQUARTERS for chains, sprockets and other Link-Belt conveying and mechanical power transmission products is your nearby Link-Belt factory branch store or authorized stock-carrying distributor.

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 14-257

**LINK-BELT**  
CHAINS AND SPROCKETS

Check 1901 opposite last page.





As a result of exhaustive studies, Ampco Metal Grade 8 is standard for replacement tubes in these surface condensers, at this major petro-chemical company.

## Reduces corrosion-erosion of 5% sulfuric-acid vapors

### On-job tests prove deterioration rate for Ampco Metal tubing one-third lower than for copper

The cooling of overhead acid vapors discharging from an  $H_2SO_4$  concentrator spelled trouble for one petro-chemical company. After six months, the top ends of the copper tubes in surface condensers had deteriorated due to corrosion-erosion. It was decided to test other materials in this service.

In one 34-day test, specimens were placed at the entrance to the tubes. Results showed that Ampco Metal Grade 8 would give about 50% longer service than the original copper tubes.

A later 45-day test — with samples placed away from tube sheets to minimize erosion — showed Ampco Metal Grade 8 superior to other copper-base and stainless alloys.

The excellent heat-transfer rate and outstanding corrosion resistance of Ampco Tubing provide highest efficiency in many types of equipment. Write us concerning your problem.

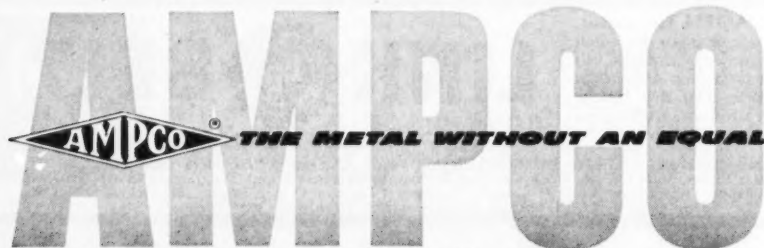
Corrosion Rate—IPY	
...In 34-day high-velocity test:	
Copper.....	0.022
Ampco Metal Grade 8.....	0.015
Carpenter 20.....	0.056
...In 45-day corrosion test:	
Ampco Metal Grade 8.....	0.0046
Aluminum brass.....	0.009
Silicon bronze.....	0.018
Type 316 (high Mo).....	0.020
Hastelloy B.....	0.0038
Alleghany.....	0.008
Nionel.....	0.0019

#### In both tests...

Temperature was 200°—270°  
Acid concentration was 0-5%  $H_2SO_4$   
Data from Chemical Engineering, Feb., 1957

PI-3

For ready reference, see the 12-page Ampco insert in Chemical Engineering Catalog.



AMPCO METAL, INC., Dept. CP-11, Milwaukee 46, Wis., West Coast Plant: Burbank, Calif.

Check 1902 opposite last page.

## IDEAS

Take the 'bugs' out of plant layout with ...

## THREE-D MODELS

DEL YOUNG

Head, Silastic Fabrication Lab  
and M. L. HIPSHER  
Materials Engineering Service  
Dow Corning Corporation  
Midland, Michigan

Early this summer, Dow Corning formally opened its one-quarter-million dollar silicone rubber fabrications laboratory. The lab, housed in a 6400 square foot building, contains three 30-ton molding presses, a 50-ton press, and a 200-ton press, a lathe for mandrel-wrapping work, two hot-air vulcanizers, two extruders, a three-roll calender, and a 20-inch autoclave.

In adjoining rooms are a unit for impregnating textile material, a laboratory, and an office.

The project involved considerable planning, not only by the engineers but also by management and production and laboratory personnel who were to eventually occupy the building and use the equipment.

The secret behind Dow Corning's obtaining maximum efficiency of layout was that they first constructed a scale model of the proposed lab. Even though most of the company's engineers felt that they could visualize the situation quite well enough from engineering drawings, many im-

portant decisions had to be made by those less thoroughly trained in the intricacies and symbolism of such drawings.

The benefits of third-dimensional models were obtained by Dow Corning without much expenditure in time or money. Almost all equipment was reduced to simple block representation. Walls are reduced to partitions a couple of inches high. Windows and doors are indicated by light and dark markers placed on these partitions.

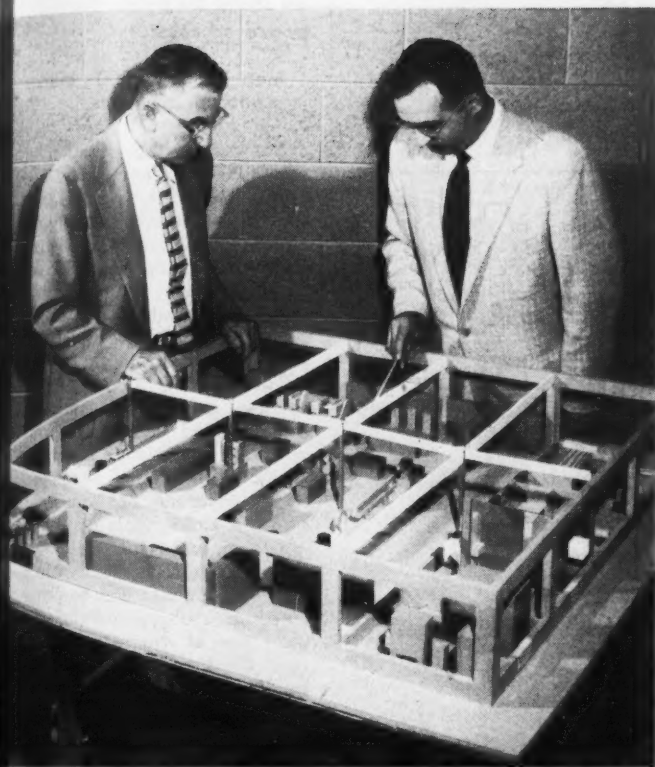
Electrical and pipe runways are shown merely by a strip of wood, scaled to the size of the area allocated to each service. Nothing is forgotten, however. Even drums and "Coke" machines are set in place.

Dow Corning has been using these models for over a year now, and can credit about eight lab layouts to this technique. Besides saving much erasing and redrawing, the models serve to develop the best layout ideas through the cooperation of all people concerned. Top management, too, has given full approval of the idea.

Del Young  
Silastic  
four

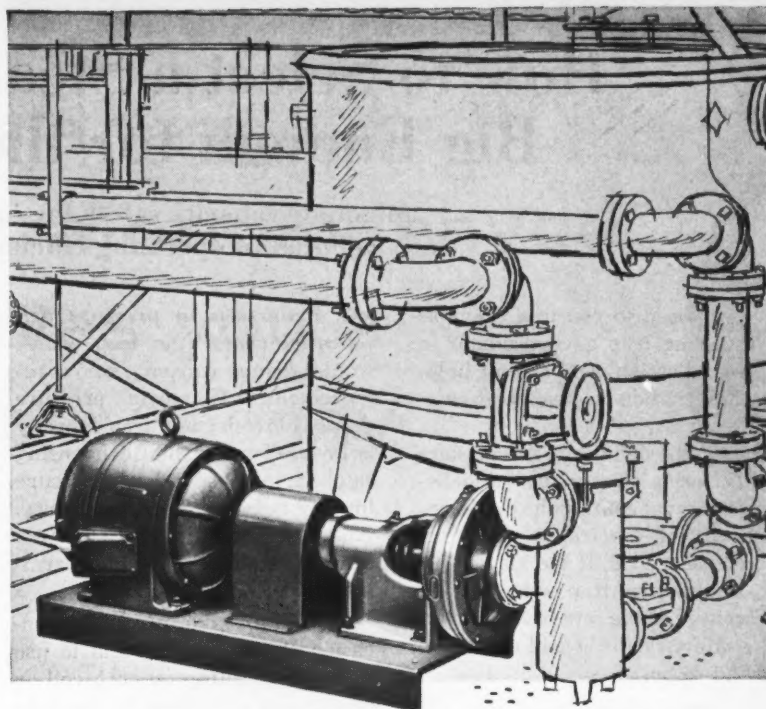
Here's  
taken fr  
is made





Del Youngs and "Hip" Hipsher check details on the model of the Silastic Applications Lab. Model is made of wood and measures four by four feet overall. Scale is one-half inch equals one foot

Here's how the finished quarter-million-dollar lab looks. Photo is taken from same angle as photo of model. (Right quarter of model is made up of separate rooms and is out of photograph, to right)



## Centrifugal pump resists erosion, corrosion, velocity-turbulence

### It's an **AMPCO**<sup>®</sup>

Made from aluminum bronze, other workable metals, and non-metallic materials that resist the action of corrosive, abrasive media. Impellers and volute shapes are designed to reduce internal turbulence and liquid-metal boundary velocities.

Ampco Pumps are available in more than 108 different combinations, with speeds from 1750 to 3500 rpm; capacities to 600 gpm; heads to 300 feet. When process

conditions change, you can alter your Ampco Pump to satisfy new requirements, easily and inexpensively.

A distributor near you has Ampco Centrifugal Pumps *in stock* — at no premium price.

Also available in  
**316 Stainless  
and Elastomers**  
...FROM STOCK!

P-33

See us in New York — Booth 412

# AMPCO<sup>®</sup>

THE METAL WITHOUT AN EQUAL

AMPCO METAL, INC., Dept. CP-11, Milwaukee 46, Wis., West Coast Plant: Burbank, Calif.

Check 1903 opposite last page.

# How to Select a Steam Trap Big Enough for the Job

Adequate capacity safety factors  
are essential to operating efficiency

As promised to you in a previous Armstrong trap advertisement in this publication, here is some helpful information on steam trap safety factors.

First, the definition. A trap safety factor is simply the ratio between actual continuous discharge capacity of the trap and normal condensate load. If the load is 500 lb/hr and the trap actually will discharge at the rate of 1000 lb/hr, the safety factor is said to be 2 to 1, and so on.

## Why a Safety Factor?

You are not going to get maximum heat transfer efficiency from any steam heated unit unless your traps are sized with a generous excess of capacity over the normal condensate load.

Remember that trap capacity is given in terms of *continuous* discharge of condensate at a given pressure differential. If you don't employ an adequate safety factor, you make no provision for these requirements or conditions:

1. **Venting of gas, O<sub>2</sub> and CO<sub>2</sub>**, would be impossible if a trap should discharge a full stream of water continuously.

2. **Peak loads** would back up condensate in the line or unit if the trap were sized for average load.

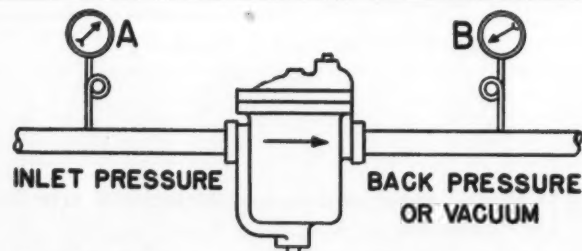
3. **Reduction in pressure differential** across the trap orifice would reduce capacity below requirements. If steam pressure drops below normal, trap capacity is lowered more than condensing rate. An increase in back pressure for any reason cuts trap capacity. And, pressure differentials often drop substantially during warming-up periods.

4. **"Group" trapping.** Very occasionally it is impractical to use an individual trap on each coil or condensing unit. Here, a generously oversized trap helps prevent backup of condensate or air from one unit to another. The frequent opening of a big trap valve "pumps" non-condensibles and condensate to the drain header.

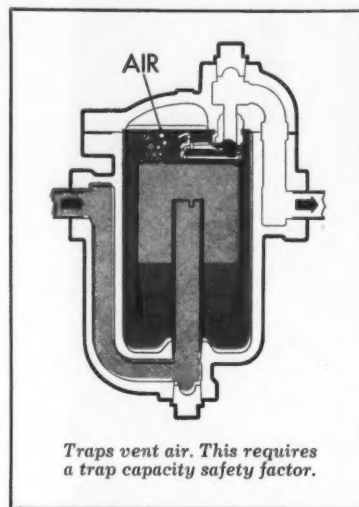
## What Safety Factor?

Fortunately, it isn't necessary to calculate safety factors. Experience is the best guide and the benefit of experience with tens of thousands of successful installations is available to you. The following table is taken from the Armstrong Steam Trap Book.

Page	Equipment Drained	Safety Factors
24	Purifiers and Separators	2 or 3 to 1
25	Steam Mains or Headers	2 or 3 to 1
26	Steam Heating Pipes...	2 to 1 up to 6 to 1
29	Unit Heaters.....	3 to 1
30	Submerged Coils.....	2, 3 or 4 to 1
32	Cylinder Dryers.....	4 to 1 up to 10 to 1



Pressure differential affects trap capacity. If "B" is back pressure, subtract from "A"; if "B" is vacuum, add to "A". Safety factors compensate for drops in pressure differential.




The page numbers listed contain completely reliable data for any trapping job.

**CAUTION.** The safety factors recommended in The Armstrong Steam Trap Book will have to be increased by an unknown factor for trap capacity ratings based on cold water tests, orifice tests or slide rule calculations. Armstrong trap steam temperature condensate capacity ratings are based on actual operating conditions which take into account such capacity-reducing factors as pipe friction and the choking effect of flash steam.

If you'd like to have a copy of the 44-page Steam Trap Book, just call your local Armstrong Representative, or write the factory. There is no obligation.

Armstrong Machine Works  
8806 Maple Street  
Three Rivers, Michigan

 **ARMSTRONG  
STEAM TRAPS**

## IDEAS

### Shakedown operations on shale oil plant prove successful

More than 2000 barrels  
produced in month

Answer to the question of whether oil from shale can compete with petroleum should be known shortly at Union Oil Co. of California's shale oil plant near Grand Valley, Colo. During first month of operation, more than 2000 bbl of highly viscous oil were produced.

The plant is modeled after smaller retorts the company has operated in research laboratories. Its design is different than the retort developed by the Bureau of Mines for its Rifle, Colo., shale plant.

The Union retort will hold about 150 tons of shale. More than this amount can be processed in a day, depending on the speed at which the unit is run. Crushed shale (4" and smaller) is fed into bottom of retort by means of "rock pump" or piston. After rising to point about midway up retort, shale encounters air being sucked downward by fans from a higher "burning" area.

In this retorting zone, at temperatures around 800°F, organic material in the shale, called kerogen, is converted to oil and vapor. This collects and condenses on cool incoming shale and is drawn off into storage tanks. Shale residue continues upward in retort, burning at about 2000°F. It is removed from top as ash.

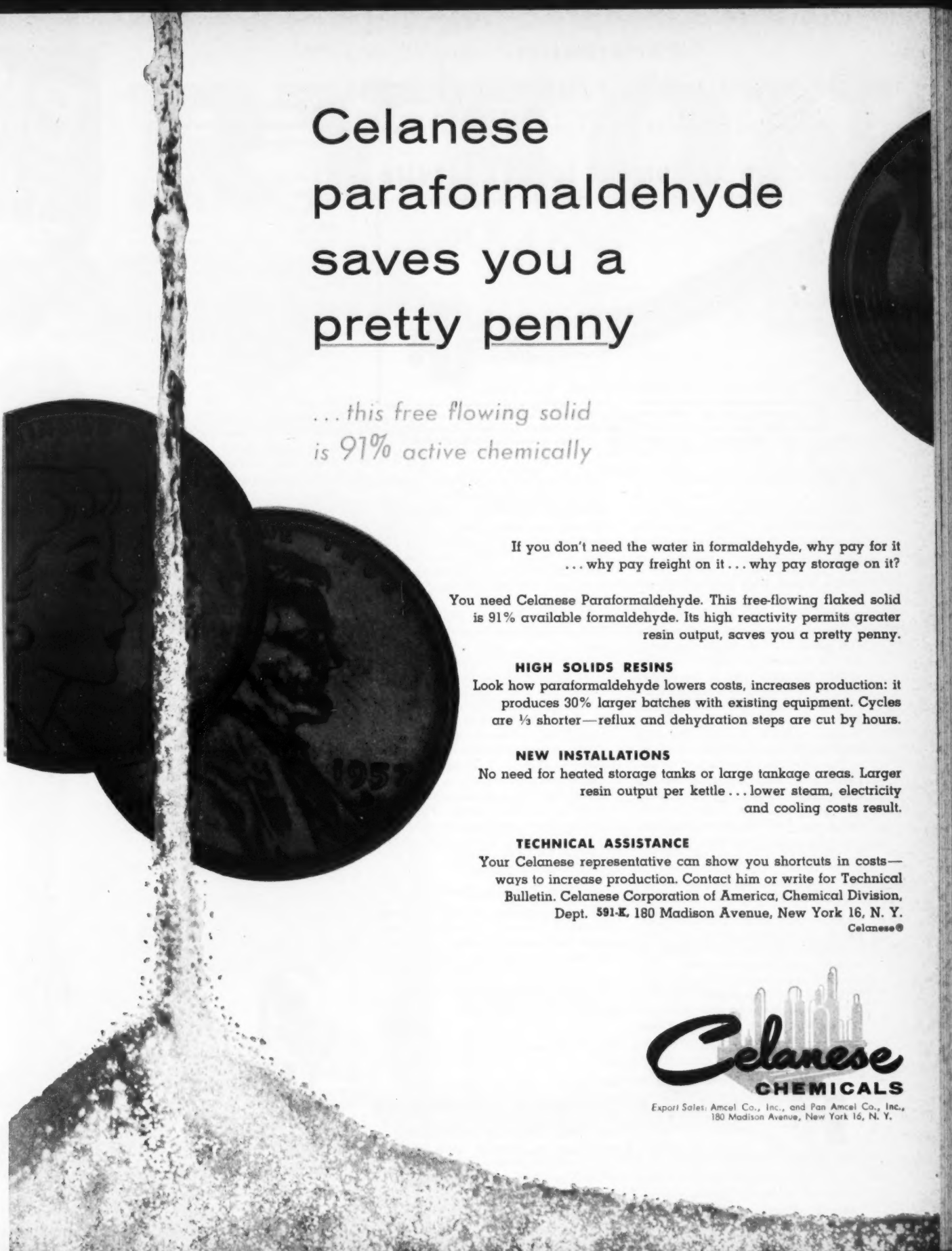
Piston can feed approximately two tons of shale every six to eight minutes, or from 360 to 480 tons per day. If shale is of 30-gal-per-ton "mahogany ledge" grade, 1440 gal of shale oil can be produced in a day.

Large quantities of non-condensable gas, by-product of retorting, could be used to generate electricity to run retort machinery. Two million bbl/day shale oil industry would produce over 993 million scf of such gas per day.

(Shale oil plant is operated by Union Oil Co. of Calif., Dept. CP, 617 W. 7th St., Los Angeles 17, Calif.)

more information  
on product  
right, specify  
see information  
request  
opposite last

Check 1904 opposite last page.



# Celanese paraformaldehyde saves you a pretty penny

...this free flowing solid  
is 91% active chemically

If you don't need the water in formaldehyde, why pay for it  
... why pay freight on it... why pay storage on it?

You need Celanese Paraformaldehyde. This free-flowing flaked solid  
is 91% available formaldehyde. Its high reactivity permits greater  
resin output, saves you a pretty penny.

#### HIGH SOLIDS RESINS

Look how paraformaldehyde lowers costs, increases production: it  
produces 30% larger batches with existing equipment. Cycles  
are  $\frac{1}{3}$  shorter—reflux and dehydration steps are cut by hours.

#### NEW INSTALLATIONS

No need for heated storage tanks or large tankage areas. Larger  
resin output per kettle... lower steam, electricity  
and cooling costs result.

#### TECHNICAL ASSISTANCE

Your Celanese representative can show you shortcuts in costs—  
ways to increase production. Contact him or write for Technical  
Bulletin. Celanese Corporation of America, Chemical Division,  
Dept. 591-K, 180 Madison Avenue, New York 16, N. Y.

Celanese®



**Celanese**  
**CHEMICALS**

Export Sales: Amcel Co., Inc., and Pan Amcel Co., Inc.,  
180 Madison Avenue, New York 16, N. Y.

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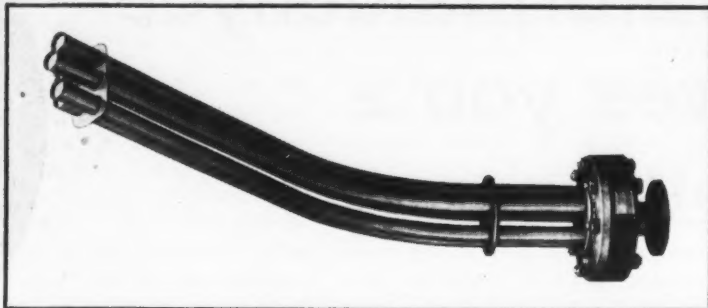




# Fansteel Corrosionomics

REGISTERED U. S. PATENT OFFICE  
A JOURNAL OF USEFUL INFORMATION FOR THE SOLUTION OF CORROSION PROBLEMS

## Tantalum Equipment in HCl Service



One of several five-tube tantalum bayonet heaters of unusual curved design, which were manufactured to fit a fused silica retort at J. T. Baker Chemical Company, Phillipsburg, New Jersey. The tantalum heaters were installed in the retort in 1937, and after twenty years of severe service are still in use.

A variety of concentrations of hydrochloric acid—ranging from cold to boiling temperatures—puts both production and maintenance equipment to severe tests in the Phillipsburg, New Jersey plant of the J. T. Baker Chemical Company. For this reason, tantalum has long been specified for the fabrication of critical in-line equipment as well as for repair parts.

Tantalum bayonets for heating process liquids, and tantalum condensers for the recovery of highly corrosive vapors find many uses in this type of service. Not only does tantalum show no corrosion under constant exposure to the chemicals in these applications, it also provides exceptionally high heat-transfer characteristics.

Tantalum dip tubes for feeding corrosion gases and liquids to various process equipment have their share in solving difficult corrosion problems, too. Some of this equipment has been in almost continuous operation in the J. T. Baker plant for over twenty years.

### Tantalum Repair Parts Extend Equipment Life

Glassed steel vessels are used in many places throughout the plant. This equipment represents a sizeable investment and from the standpoint of economical processing, extended service life is very important. The life of these vessels has been materially increased through the use of tantalum

repair plugs and special shaped patches which are studded directly to the steel. In many cases severely corroded nozzles and openings in glassed steel equipment have been repaired using tantalum sleeves. Without the use of tantalum these units would have to be returned to the vendor for re-enameling.

One example comes from a J.T.B. Engineering Department report which states:

"A large \$12,000 glassed steel reactor developed severe corrosion at the bottom outlet nozzle. The extent of damage was so extensive that the vendor's service engineers were brought in for consultation. In their opinion any repairs would be highly questionable. J. T. Baker maintenance personnel felt that a successful repair could be made using a special modified tantalum sleeve. The process was kept 'on stream' for over two years before the reactor had to be returned for re-enameling."

### Free Tantalum Test Kit

A corrosion test kit, available without charge to research technicians, contains both tantalum sheet and wire. Request it on your letterhead.

The above condensation is typical of articles which appear in **CORROSIONOMICS**, a Fansteel publication. Mail us your name for inclusion on our mailing list.



See us at the New York Chemical Show, Dec. 2-6—Booth 617

**FANSTEEL METALLURGICAL CORPORATION**  
CHEMICAL EQUIPMENT DIVISION

NORTH CHICAGO, ILLINOIS, U. S. A.

G575A

Check 1906 opposite last page.

## IDEAS

### Insulation material tests for nuclear reactors prove promising

Two insulation materials for nuclear reactors that apparently are only slightly damaged by neutron and gamma exposure have been discovered. The materials, alumina-silica body in felt form and pure silicon dioxide in batt form, were subject to testing in both reactors and cyclotrons. Results of tests indicated satisfactory minimum of nuclear poisoning and no adverse affects to thermal properties of both materials by exposure to high order neutron and gamma fluxes.

Although there is about 10% reduction of thermal conductivity, apparently due to nuclear radiation in alumina-silica, recovery to approximately original value was indicated after few hours removal from reactor. Tests were conducted by General Electric Co.

(Based on paper presented at recent ASME meeting. To obtain paper 57-F-9, "Thermal Conductivity of Insulating Materials for Use in Nuclear Reactors" remit 50c direct to American Society of Mechanical Engineers, Dept. CP, 29 W. 39th St., New York 18, N.Y.)



"Alabama and 12, . . .  
Notre Dame and 6 . . ."

## BASIC FACTS

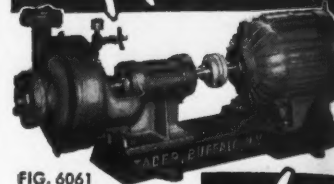


FIG. 6061

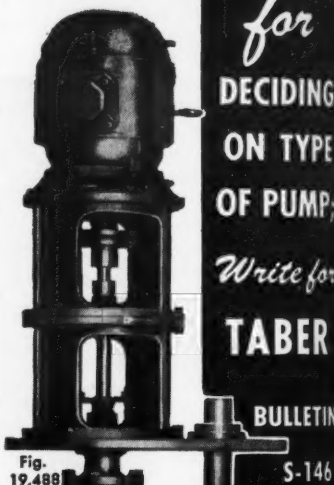


Fig. 19,488

for  
DECIDING  
ON TYPE  
OF PUMP;  
Write for  
TABER

BULLETIN

S-146

## Practical GUIDE TO PUMP SELECTION

Big illustrations and brief descriptions with capacities and adaptability of pumps are contained in this unbiased compilation of facts to help avoid costly misapplication. Bulletin S-146.

TABER PUMP CO.  
Est. 1859  
320 Elm St.  
Buffalo 3,  
N. Y.

**TABER**

Check 1907 opposite last page.

CHEMICAL PROCESSING

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New from Standard Oil

# RYKON

GREASE



*Standard scores major breakthrough in grease technology to bring you better lubrication...help you make important savings in grease use, application and inventorying.*

Scientists at Standard Oil have developed a new non-soap, organic, grease thickening agent. This, plus other improvements in grease formulation, is now available in a new line of Standard greases named RYKON.

**Mechanical stability**—RYKON Greases show little change in consistency even under severe working.

**Oxidation stability**—Exclusive thickener in RYKON Greases inhibits oxygen absorption. This prevents costly corrosive action on bearings.

**Water resistance**—Extremely resistant to water washout.

**High temperature stability**—RYKON Greases have an ASTM dropping point of 480° F. They have exceptional heat stability.

**Resistance to change**—RYKON Greases remain soft and grease-like at sustained high temperatures, continue to give thorough lubrication.

**Low temperature stability**—RYKON Greases work readily at low temperatures, lubricate from a cold start.

**Oil separation**—RYKON Greases exhibit strong resistance to bleeding.

**Rust preventive properties**—RYKON Greases demonstrate superior natural qualities in prevention of rust.

To meet specific grease lubrication problems, greases in four Regular and three Heavy Duty grades are available. With a single RYKON multi-purpose grease doing all jobs in the plant, there's no wrong grease to use. Money invested in grease inventories is cut, storage and application facilities are reduced. Maintenance training is simplified.

Get the facts about RYKON Greases from the industrial lubrication specialist at the Standard Oil office nearest you in any of the 15 Midwest and Rocky Mountain states. Or write Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.



**STANDARD OIL  
COMPANY**  
(Indiana)

For more information on product at right, specify 1908 see information request blank opposite last page.

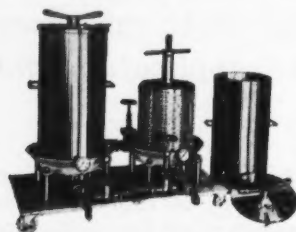
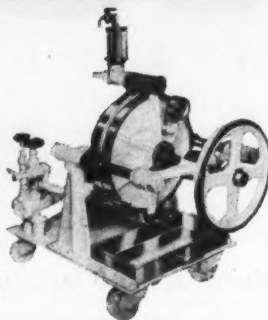




# Step Up Your Production with ERTEL ASBESTOS DISK FILTERS

## 1. EBW MODEL PORTABLE FILTER

A highly efficient, readily portable filter that meets requirements for smaller capacities. Performance proven over the years in many hundreds of plants. Perhaps Ertel EBW model can economically speed up your production. Ask for full particulars.

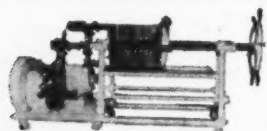
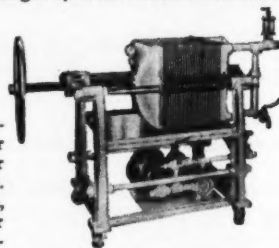


## 2. ECD TWIN MODEL DISK FILTER

Typical of Ertel craftsmanship is this Positive Seal Multi-Purpose Disk Filter. The outstanding feature of independent filtering elements provides positive seal of any type filtering medium. Cylinder prevents loss of liquid—particularly well adapted for volatile liquids as well as many other ordinary filtering requirements. Sizes available to hold from 4 to 30, 12 1/4" dia. asbestos filter disks, filter cloths or filter paper in each cylinder. Single cylinder models available.

## 3. EU MODEL UTILITY FILTER

The Ertel Filter that's designed to use asbestos filter sheets, filter cloth, filter paper or filter cloth and filter aid. Standard units in bronze, nickel plated, stainless steel or hard rubber circulatory system. Comparison and operation records prove the EU Model unmatched in design, versatility and operation-life. Experience has shown that the great majority of filtration problems can be solved by your consultation with our engineers. May we help you?



## 4. EUS MODEL STAINLESS FILTER

Built in sizes to accommodate from 10 to 100 asbestos filter sheets, filter paper or filter cloth. Capacity 5 to 150 gpm. depending upon product.



ASK FOR ILLUSTRATED CATALOG  
Describes the complete line of precision built  
Ertel Liquid Handling Equipment for Industry.

**ERTEL ENGINEERING  
CORPORATION**

KINGSTON 3, NEW YORK  
Branch Office & Showroom Located in New York City

COMPLETE LINE OF  
**Liquid Handling Equipment**



Check 1909 opposite last page.

## IDEAS



Closed-circuit TV system camera transmits view of bulk polymer passing through high-energy electron beam from Van de Graaff accelerator

Closed-circuit TV system at The Dow Chemical Company, proves to be effective tool for . . .

## Safe Monitoring of Radiation

JOHN C. STEEVENS, Assistant Editor  
With DR. W. H. BEAMER  
Radiochemistry Laboratory  
The Dow Chemical Company

High-speed electrons and radiations are generated by two-million volt Van de Graaff accelerator in 300 sq ft room with 12 ft ceiling at The Dow Chemical Company, Midland, Mich. In order to observe passage of samples through high-energy electron beam and provide maximum safety to personnel, a closed-circuit television system was installed.

System consists of a camera with remote electrical controls and a monitor. The monitor is located about 40 to 50 ft from the camera which is set up in the radiation room. Although the room is surrounded by concrete walls three-ft



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(Product of  
Div., Thomps  
10th and Sher  
gan City, Indi  
Check 1910 op

Outside radiation  
control conveyor  
radiation proces  
monit



thick, the TV system permits continual observation of operations in the room. Because it is as simple to operate as the average TV set in the home, system requires no specially trained personnel.

There has been no maintenance necessary since installation — about 10 months ago. Original cost for equipment and installation was about \$2000. Although radiation has a tendency to cause a gradual darkening of the camera lens, this has not been a problem in the system at Dow. Special radiation resistant lenses are available if conditions necessitate their use. Operation of the camera tube is not affected by radiation.

Additional safety precautions to protect the operator from radiation accidents include series of interlocks on doors to room, horn signal at start of machine operation, and red lights during operation.

(Product of Dage Television Div., Thompson Products Co., 10th and Sheridan Sts., Michigan City, Indiana.)

Check 1910 opposite last page.

Outside radiation room, operator can control conveyor belt while observing radiation process through television monitor screen



## Here's extra dependability for pumping most ANY flowing liquid

**Bronze, nodular iron, stainless steel, high nickel alloys** — in fact, all metals that can be cast and machined — are available in Allis-Chalmers single-stage, double-suction pumps.

This material availability makes A-C pumps exactly *right* for your problems of temperature, corrosion and contamination... makes them extra-reliable for pumping most liquids that flow.

**Adding to this reliability** is the optional feature of adjustable axial-clearance wearing rings. They keep pump efficiency high... have saved as much as 75% maintenance and replacement costs. Too, axial clearances prevent jamming. Another optional feature — mechanical seals — can be furnished.

### These Pumps

are offered in a wide variety of sizes from 1½" to 72" with capacities to 225,000 gpm, heads to 600 feet. Contact your A-C office, or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.

# ALLIS-CHALMERS

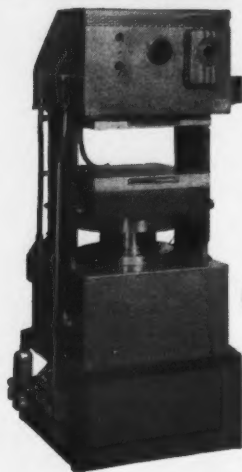


A-5532

Check 1911 opposite last page.

## HYDRAULIC PRESSES

20 tons to 500 tons ram pressure



Platen area 8 to 24 inches  
Motorized hydraulic system  
Controlled platen temperatures to 600° F  
Automatic time cycler  
Customized to your requirements

**Φ PHI PRESS** formerly Preco

Write for circular  
or if you prefer we'll have  
our nearest representative  
call on you...

Pasadena Hydraulics, Inc., 1433 Lidcombe, El Monte, Calif.

Check 1912 opposite last page.

## ACCURATE EASY READING MANOMETERS

For precise reading as well as for accurate measurements choose Trimount Manometers.

Sturdy construction—long lasting—used for many purposes—Multiple Tube, Well Type, U Tube, etc. Also custom made to your specifications.

See our booth 519  
at The ISA show

Write for  
Illustrated Bulletin C

**Trimount**  
INSTRUMENT CO.  
3119 WEST LAKE STREET • CHICAGO 12, ILLINOIS

Check 1913 opposite last page.

## IDEAS

### Element 102 discovered through scientific effort on international level

A joint international research team consisting of scientists from Argonne National Laboratory (USA), Atomic Energy Research Establishment at Harwell (UK), and Nobel Institute for Physics (Sweden) has participated in a combined effort resulting in discovery of Element 102.

The new element was found by bombarding curium with carbon ions accelerated in the cyclotron at the Nobel Institute in Stockholm. This isotope of Element 102, thought to have an atomic mass number of 253, is very unstable, having a half life of about 10-12 minutes, and emitting alpha particles.

The name proposed for the new element is Nobelium, after the institute where the work was performed. Preparation of the element and a study of its properties extends man's fundamental knowledge of matter.

(Information courtesy of Argonne National Laboratory, PO Box 299, Lemont, Ill.)

### Tiny air sampling device weighs less than 2 lb, is simple to operate

Has built-in explosion-proof power source

Weighing less than two pounds and costing only a fraction of conventional equipment, a small, pint-size air sampling device has been developed by Du Pont industrial hygienists, Wilmington, Delaware. Unit is simple to operate and, with the exception of a single valve, has no moving parts.

Its small size and built-in explosion-proof power source permits safe collection of air samples in cramped or crowded quarters.

Principal part of device is an aspirator using a micro-venturi principle in which Freon propellant is ejected through a jet nozzle at high speed, creating a vacuum in

## The Problem of Oil Vapor ... and how to solve it!

Manufacturers of chemicals, pharmaceuticals; users of pneumatic instrumentation; processors of foodstuffs... all encounter critical procedures wherein hydrocarbon vapor in compressed air and process gas streams produces adverse results:

Aeration and agitation of liquids  
Air-cleaning of containers  
Protection of desiccants for dehydration

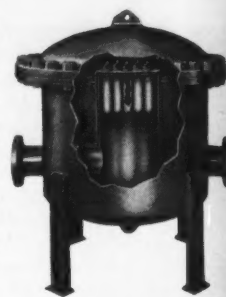
The Selas Vape-Sorber, effectively combining principles of liquid-gas separation and high capacity oil adsorption, completely removes hydrocarbon vapors, dirt and liquid-phase entrainment of every kind. Its compact, welded steel construction contains no moving parts, requires minimum maintenance.

Send for your free copy of this new Vape-Sorber booklet No. 1111. It describes, by chart and table, the exact size and model for your requirements.



**SELAS CORPORATION OF AMERICA**  
Heat and Fluid Processing Engineers  
DRESHER, PENNSYLVANIA

Check 1914 opposite last page.



**SELAS  
VAPE-SORBER**



Don't ruin a valuable piece of equipment merely because some part is rusted tight. Apply Kroil, the amazing new chemical lubricant that creeps into millionth inch spaces (proved by laboratory tests), dissolves rust, supplies necessary lubrication and

## LOOSENS FROZEN PARTS

18,000 of America's leading plants can't be wrong! They have used KROIL for 10 years and are still depending on it to save expensive labor and valuable parts. They say: "Kroil loosened bushings after a 12-ton press had failed" ... "on repairing heat treat trolleys formerly destroyed every nut. Now Kroil saves them all, and time, too!"

You too should be using KROIL every day. Try it on money-back basis. Gallon \$4.00; with Kroil trigger squirt gun (shoots a drop or a stream 15 feet, if desired) \$4.95, f. o. b. our factory.

KANO LABORATORIES 1051 Thompson Lane, Nashville 11, Tenn.

**KANO LABORATORIES**

Check 1915 opposite last page.

CHEMICAL PROCESSING

the venturi size orifices between the container and control operation sampling rate Tests show of Freon p from aspirato air sample s produce any For most a exception o counts, suction



Pint-size air into p

tor is connected glass impinger about 40-ml to be analyzed through the impinger. The lutant is de changes in t by subsequent analysis.

(Jet air sam obtained from trial Equip Main St., W Check 1916

## Foreign op

Recent deve cial control operations 171-page b between co domestic an tions is de tions of mo niques to o examined. Report 2, members \$, ternational sociation, I New York

the venturi cavity. Different size orifices can be inserted between the Freon supply container and the venturi to control operating pressure and sampling rate.

Tests show that the amount of Freon propellant vented from aspirator does not dilute air sample sufficiently to introduce any significant error.

For most air sampling, with exception of solid particle counts, suction end of aspira-



Pint-size air sampling device fits into palm of hand

tor is connected to a standard glass impinger assembly of about 40-ml capacity. Samples to be analyzed are bubbled through the test solution in the impinger. The amount of pollutant is determined by color changes in the test solution or by subsequent laboratory analysis.

(Jet air sampler kit may be obtained from Union Industrial Equipment Corp., 175 Main St., White Plains, N. Y.)

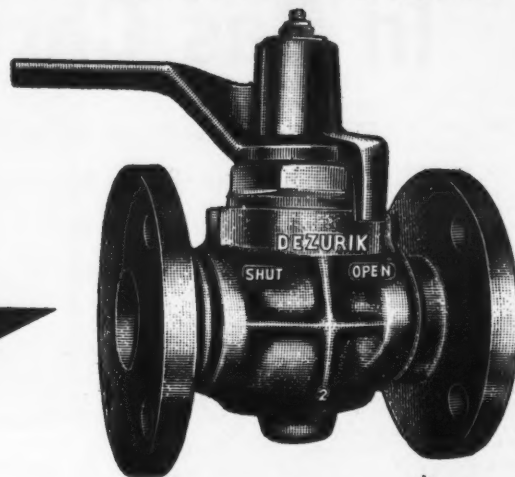
Check 1916 opposite last page.

#### Foreign operations

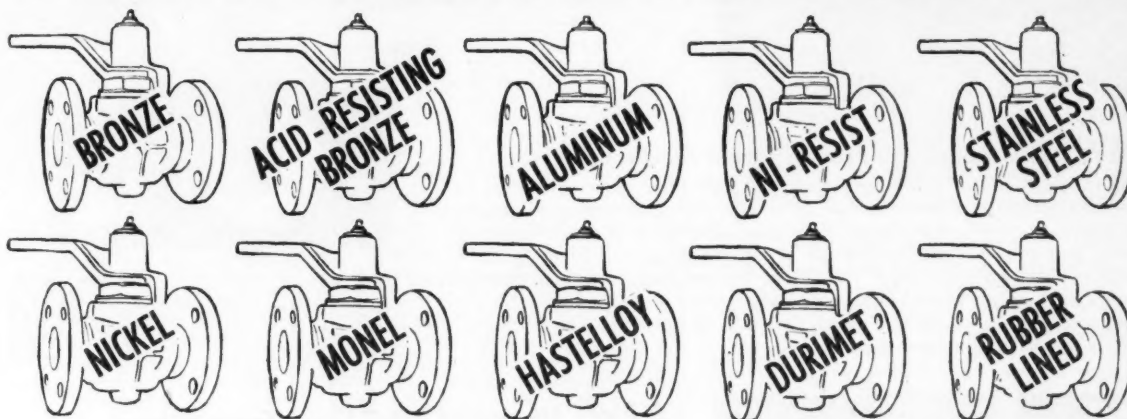
Recent developments in financial control methods in foreign operations are discussed in 171-page booklet. Difference between control methods in domestic and foreign operations is described. Applications of modern control techniques to overseas business are examined. To obtain Special Report 2, remit \$3.75 (AMA members \$2.50) direct to International Management Association, Inc., 1515 Broadway, New York 36, N. Y.

## WHAT'S YOUR CORROSION PROBLEM?

HERE'S  
THE  
ANSWER!



**DeZurik Valves are available in \***



\* AND OTHER METALS

**PLUGS ARE AVAILABLE WITH HYCAR, NEOPRENE, HYPALON, HARD RUBBER OR TEFLON FACING.**

DeZurik Valves' complete range of materials is matched by a complete line of models: manual, pneumatic, hydraulic or electric operation. DeZurik's exclusive eccentric action guarantees dead-tight shut-off and easy operation without lubrication! For more details on DeZurik Valves see us in Booth No. 907 at the New York show or write to

Representatives in all principal cities.

**DeZURIK**  
CORPORATION  
SARTELL, MINNESOTA

Check 1917 opposite last page.



# Perkin-Elmer Announces 3 New Advances In Gas Chromatography

Since the advent of commercial gas chromatography instruments, Perkin-Elmer has been a leader in the development of new instruments and techniques. Now Perkin-Elmer announces three new instruments, each a unique advance in its field.

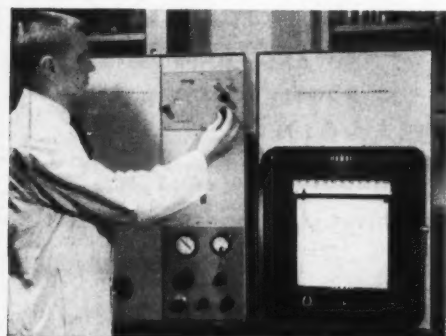


## **NEW! The Model 188 Triple Stage Vapor Fractometer**

will analyze an unknown multi-component sample faster than any gas chromatography instrument in service today. The Model 188 makes three simultaneous analyses of high, medium and low boiling components, each under optimum chromatographic conditions. The instrument will analyze mixtures with components ranging from light gases to liquids boiling at 400°C. or higher.

## **NEW! The Model 184 Process Vapor Fractometer**

performs continuous multi-component analyses of a wide variety of process streams. The instrument automatically withdraws samples from the stream at timed intervals and determines the concentration of from one to four pre-selected components, recording these with exceptional reproducibility on a bar chart. The Model 184 was evolved from experimental instruments placed in actual plant service by ten leading petroleum and chemical companies over a period of almost two years. Shown here is face of programmer unit.



## **NEW! The Model 154-C Vapor Fractometer**

brings automatic range control to gas chromatography. The 154-C anticipates high peaks and automatically attenuates them to manageable proportions, leaving the operator free to go about other work. The Model 154-C also features two new accessories: a combustor for reducing complex hydrocarbons such as octane to CO<sub>2</sub> and H<sub>2</sub>O for easier, faster determination; and a high-temperature column that handles liquids with boiling points up to 400°C.

For further information write us at 850 Main Avenue, Norwalk, Conn.

INSTRUMENT DIVISION

**Perkin-Elmer** Corporation  
NORWALK, CONNECTICUT

Check 1918 opposite last page.

## IDEAS

### **Confidential formulations of specialty resins, polymers**

Custom preparation service supplies confidential formulations of made-to-order specialty resins and polymers in bulk, suspension, solution, or emulsion. Production requirements, including composition, viscosity, solids content, and other individual specifications can be handled. Block and graft polymers, and polyelectrolytes such as methacrylic acid/vinyl pyridine copolymers are part of service.

(Preparation service is offered by Monomer-Polymer Laboratories, Chemical Div., the Borden Co., 5000 Langdon St., Philadelphia 24, Pa.)

Check 1919 opposite last page.

### **US research reactors listed, described**

More than 30 research reactors now in operation or under construction are described in 73-page book, illustrated with drawings, photographs, diagrams, and charts. Reactors are grouped according to major types. One or two examples of each type are described at length. Features of others are illustrated, and significant data given for all. Cost information is furnished whenever available, including analysis of the relation between initial cost of reactor itself and total costs incurred to make it useful. To obtain "U.S. Research Reactors" remit \$1.50 direct to Office of Technical Services, US Department of Commerce, Washington 25, D.C.

### **High temperature study**

Report of 41 pages describes chemical method of producing temperatures in 5000-6000°K range. To obtain "Study of Ultra High Temperatures" (PB 121074) remit \$1.25 direct to Office of Technical Services, US Department of Commerce, Washington 25, D.C.

more information  
on products  
right, specify  
see information  
request by  
opposite last page

# Magnetic ideas from **ERIEZ**

**SAFE SAFE!** No need to fear this safe will fall! . . . it's held firmly to the hoister by the tremendous magnetic strength of an Eriez Permanent Magnet. Combining herculean power and lifelong dependability, Eriez non-electric Magnets have found practical and valuable uses in industry, where Eriez HI-POWR magnetic separators are used to remove tramp iron from processing lines before it can start fires, damage machinery or cause product contamination. Eriez HI-POWR Automation Units are also used to control, convey and hold metals, from small parts to large steel sheets and pipe. They are easily installed on new or existing equipment, and offer many automated materials handling advantages. *All Eriez Magnets are non-electric, self-contained. They operate without any wires or attachments; magnetic power is guaranteed forever. The first cost is the only cost.*



#### GRATE MAGNET GRABS FAINTLY FERROUS SLAG.

To help reduce rejects in dinnerware (caused by slag in the placing sand) the Buffalo Pottery Company of Buffalo, New York, installed a series of six Eriez Grate Magnets one above the other. The unit is directly below a gyratory riddle which is fed 10 tons of sand per hour. The unique design of the grate assures maximum spreading of the sand over the magnetic elements, without choking the flow of the purged material. The contaminated sand flows through the grates, onto the magnetic tubes and deposits ferrous particles on them. The top grate traps particles of stronger magnetic attraction, while the bottom magnet traps impure sands with so little imbedded iron that reaction to a test magnet is almost negligible. (In a recent quality-control test, an Eriez Grate Magnet removed 93% of a 100-200 mesh iron contamination in one pass through the magnet). Buffalo Pottery reports that since installation of the unit, rejects due to slag and impure sands have been virtually eliminated.



#### Eriez HI-VI electro-permanent magnetic vibratory equipment

Here's the first complete line of electro-permanent magnetic vibratory equipment that operates at 3600 CPM directly off an AC line. Just plug the units in—no rectifier needed! Eriez HI-VI units provide greater vibratory output with less power consumption. Less maintenance; lower installation costs. Lifetime-powered Alnico V magnetic element produces exclusive "double action" drive for greater productivity.

#### HI-VI Vibratory Feeders

convey, spread, agitate, cool, blend, mix, etc. Give an accurate, controlled feed to bulk materials.



#### HI-VI Unit (Bin) Vibrators

self-adjusting units keep bulk materials pouring evenly and smoothly through hoppers, bins, chutes, ducts, etc. Eliminate pile-ups, bridging, sticking, etc.



**ROTA-GRATE GOES GREAT!** Shown in use at the Columbus, Ohio plant of the American Zinc Oxide Company is a new Eriez development—the Rota-Grate. It's a revolving magnetic unit that provides fast, automatic removal of tramp iron from bulk materials which tend to clog or bridge when passed through small openings. Powerful magnetic tubes are rotated through material flows coming from above, combing and breaking the flows apart and trapping microscopic fines as well as larger pieces of iron. Rota-Grates may be installed at the discharge end of open or enclosed chutes, or may be enclosed within housings in open or closed duct systems. The unit is efficient for removal of ferrous contamination from fine cohesive materials such as cornstarch, lime, gypsum, or from fibrous materials such as alfalfa, flax, chopped hay, etc.

**ERIEZ . . .** pioneers and world's largest producer of Permanent Non-Electric Magnetic Equipment for Industry have three major product lines to serve your needs.

**HI-POWR MAGNETIC SEPARATORS** (like those shown above) to remove unwanted iron from processing lines.

**HI-POWR MAGNETIC AUTOMATION UNITS** to handle untold materials handling problems . . . convey, transfer, control, elevate, re-position, etc., ferrous materials or parts during many manufacturing processes.

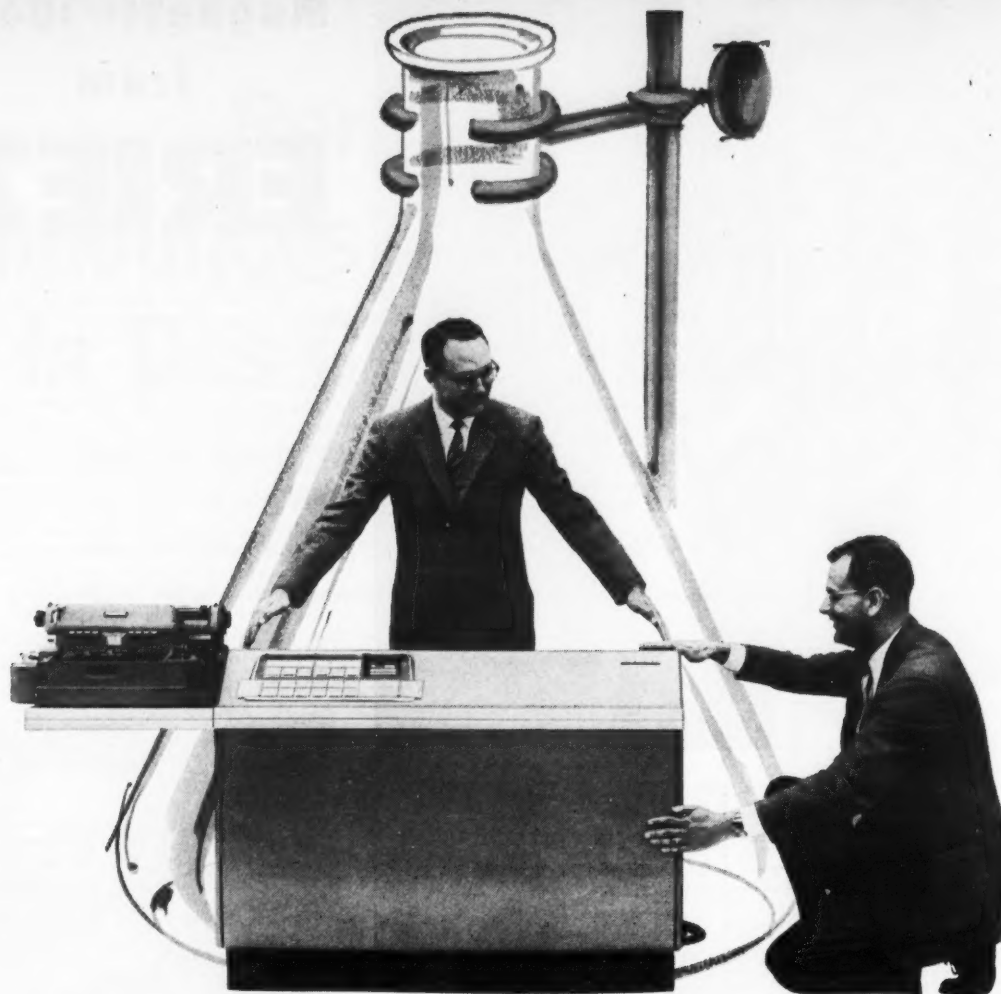
And

**HI-VI VIBRATORY EQUIPMENT** to move and accurately feed bulk materials. Eriez "Magnetic Ideas" can help you. Eriez' factory-trained field men, backed by Eriez extensive laboratory and engineering know-how, will be happy to study your particular problem, make a plant survey, and offer helpful "Magnetic Ideas."

**WRITE FOR BIG NEW COMPREHENSIVE CATALOG OF ERIEZ ENTIRE LINE TODAY . . .** state your particular problem and we'll try to assist. Eriez Manufacturing Company, 73Y Magnet Drive, Erie, Pa.

For more information on product at right, specify 1920 see information request blank opposite last page.





## Take the tedium out of correlation studies with this powerful electronic computer **ROYAL PRECISION LGP-30**

**Large capacity . . . easily programmed  
and operated . . . mobile . . . low in cost**

Compact, simple to use . . . Royal Precision LGP-30 brings high-speed electronic computation *right to your desk* . . . relieves you of the tedium of statistical analysis in such areas as research and product development, quality control and process control. And at the lowest cost ever for a complete computer system!

**Faster answers; unusual capacity.** Used wherever you want it, LGP-30 operates from any conventional wall outlet, is self-cooled. Providing fast, effortless answers for all types of statistical studies—correlations, analysis of variance, regression analysis, curve-fitting — LGP-30 gives you speed and memory (4096 words) comparable to computers many times its size and cost . . . stored-program operation for complete flexibility. Result: you save valuable time . . . handle more assignments . . . go forward to truly *creative* work.

Easy to operate and program. Controls have been so thoroughly simplified, LGP-30 may be operated with only minimum computer experience. Answers are printed out directly . . . do not require deciphering. Programming is easily learned. A library of sub-routines, plus programs for a wide variety of applications (including Box technique for experimental design), are available.

**Wide range; exceptional value.** The most powerful computer of its size yet developed, LGP-30 is the greatest value in today's market. Remarkably small initial investment is combined with low operating and maintenance costs. Service facilities are available coast-to-coast. For further information and specifications, write Royal McBee Corporation, Data Processing Equipment Division, Port Chester, N. Y.

# ROYAL MCBEE

WORLD'S LARGEST MANUFACTURER OF TYPEWRITERS  
AND MAKER OF DATA PROCESSING EQUIPMENT

Check 1921 opposite last page.

**Reactor remotely serviced  
with closed-circuit, 3-D  
color TV system**

Permits use of easier-to-identify color-coded parts

What is reported to be the world's first closed-circuit, three-dimensional color television system has been developed for remote servicing of nuclear reactors used in work being done on nuclear aircraft propulsion system. Work is being conducted at AEC's test site, Idaho Falls, Idaho.

Color stereo system was developed to permit use of color-coded parts in reactor components and provide degree of precise depth perception required for their correct positioning. Use of color makes identification and remote adjustment of parts much easier.

In use, television camera is positioned inside radio-active area. Viewing screen is located considerable distance away, behind thick shielding walls and near controls of mechanical manipulator. Movements of manipulator inside radioactive area are directed by technician from 3-D color picture appearing on screen.

Special polarizing glasses similar to those used with recent 3-D motion pictures are used to view picture. Manipulator controls are included for aiming and focusing twin lenses of camera.

System is adaptable for other applications such as process control, inspection and maintenance, conferences, etc.

(Information courtesy of General Electric Company, Schenectady 5, N.Y.)

### Radioisotopes catalog

Revised technical data and prices of radioisotopes are listed in 182-page catalog. Information pertinent to obtaining the isotopes is included. To obtain 1957 catalog and price list of radioisotopes, send letterhead request to Oak Ridge National Laboratory, Dept. CP, PO Box X, Oak Ridge, Tennessee.

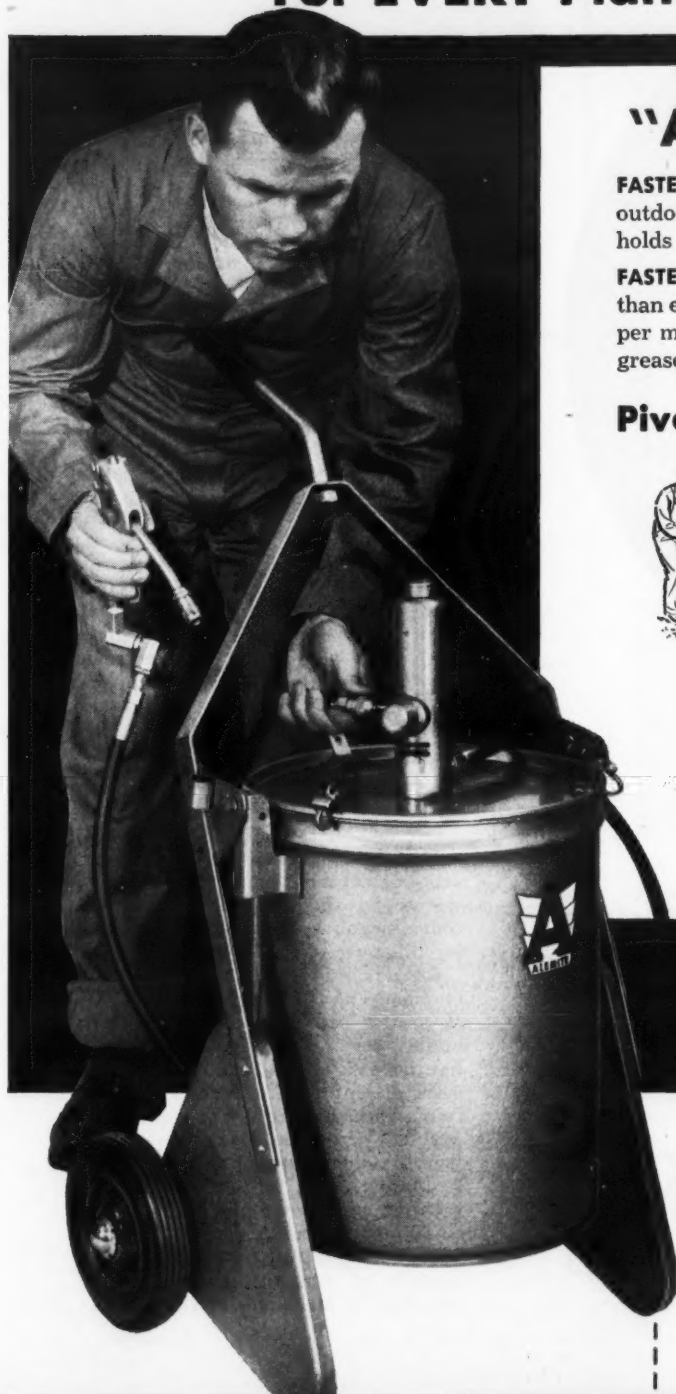
Check 1922 opposite last page.



*Roll It Anywhere for Fast High-Pressure Service!*

# ALEMITE PORTABLE POWER GUN

**For EVERY Plant Lubrication Job!**



## "AIR-POWERED 711-A"

**FASTER**—because it's easier to handle! Saves lubrication time outdoors or indoors—anywhere in the plant. Pivot-swing dolly holds container upright at any pulling angle.

**FASTER**—because exclusive, newly designed pump packs more than enough power for every job. Delivers 14½ oz. of gun grease per minute at 70°F. Holds 25-, 35-, or 50-lb. pail—or 70 lbs. of grease. Dynamic primer assures positive priming.

## Pivot-Swing Dolly For Easy Moving...



Over rough ground!



Up and down steps!



Over rough floors!

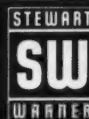
## Electric-Powered "Porta-Kart"

Only 18" wide. Easily moves through narrow aisles. Capacity, 12 pounds. Delivers 13 oz. of pressure gun grease per minute. Automatic switch shuts off motor when 5,000 lbs. of pressure is built up. Model 7182-B.

Step up to modern, time-saving lubrication methods! Check Alemite's complete line of air-powered and electric-powered lubricators.



# ALEMITE



Division of STEWART-WARNER CORPORATION

## MAIL COUPON FOR FREE CATALOG!

Alemite, Dept. K-127, 1850 Diversey Parkway  
Chicago 14, Illinois

Please send me your complete catalog on Alemite lubrication equipment for industry.

Name .....

Company .....

Address .....

City ..... Zone ..... State .....

For more information on product at right, specify 1923 see information request blank opposite last page.



# Clark

## FITS TO A "T"



- ★ LOW INITIAL COST
- ★ EASY TO INSTALL
- ★ LOW MAINTENANCE
- ★ MINIMUM INVENTORY

Ask Your Distributor For These CLARK Fluid Controls

Inverted Bucket Traps  
Open Bucket Traps  
Float Traps

Venting Traps  
Thermostatic Traps  
Vacuum Traps

Pressure Regulators  
Y-Type Strainers  
Pressure Reducing Valves

STANDARDIZE ON THE COMPLETE CLARK LINE

ASK YOUR DISTRIBUTOR OR WRITE  
DIRECT FOR FREE BROCHURES ON  
CLARK FLUID CONTROLS

THE **Clark**  
MANUFACTURING COMPANY  
1831 East 38th St. • Cleveland 14, Ohio

Check 1924 opposite last page.

## IDEAS

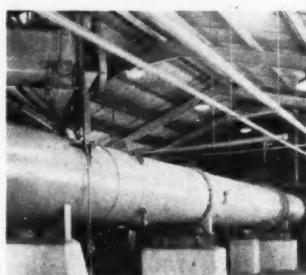
### Gamma radiography

Bulletin of 12 pages defines gamma radiography and answers some important questions in regard to its applications. Choosing radiographic source, methods for making exposure, and applications and installation are discussed. Equipment for industrial radiography is shown. Bul 1257 — Picker X-Ray Corporation, Dept. CP, 25 S. Broadway, White Plains, N. Y. Check 1925 opposite last page.

### Drying beds eliminated with new sewage drying system

Sewage does not have to be spread over acres of land

Savings in space and equipment costs are among the advantages cited for recently developed drying system for sewage sludge and industrial wastes. Basic unit in the system is a Standard-Hersey rotary



Basic unit in sewage drying system is rotary dryer

tary dryer. Dryer is compact and original investment cost is said to be about half that of conventional equipment used for this purpose.

Big advantage is that dryer eliminates need for large areas of drying beds and miles of outfall sewers. Sewage does not have to be spread over acres of land at the mercy of rainfall which naturally delays drying. There is no odor problem encountered with the system either.

Dryer can handle sludge of 75-80 percent moisture, reducing it to 6 percent. A saleable product of uniform particle size, friable and non-dusty, is

obtained. Product can be treated to definite pH and can be improved as fertilizer by easy addition of nitrogen and phosphorous.

Two sewage disposal plants have already installed the system. Both are at Corpus Christi, Texas. Output of one is 680 lb of sludge (6 percent moisture) per hour. The other plant produces more than 4000 lb of sludge per hour.

Skin temperature of the dryer furnace averages about 275°F. Dryer shell does not exceed 200°F at any point. Dryers used in the plants are 4' in diam and 42' long.

(Drying system was developed by Standard Steel Corporation, 5001 South Boyle Ave., Los Angeles 58, Calif.)

Check 1926 opposite last page.

### Tips for draftsmen

Booklet contains 59 shortcuts to speed drafting and computation work. Included are 22 drafting shortcuts, nine easy-to-use practical shortcuts to formulas and other engineering data, and 18 board time-savers. "Time Saving Tips for the Draftsman and Engineers" — Reader Service Div., Frederick Post Co., 3650 N. Avondale Ave., Chicago 18, Ill.

Check 1927 opposite last page.



"We ran out of office space!!!"

For more information on product at right, specify 1928 . . . see information request blank opposite last page.

SAVES

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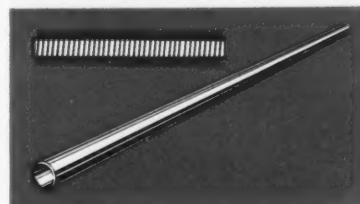
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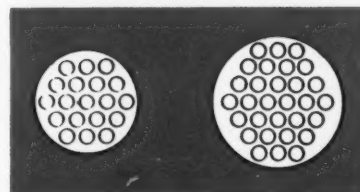
## HERE'S THE WAY TRUFIN TYPE S/T HELPS YOU SAVE

You know what they say—about a good picture taking the place of a thousand words. Well, most of the time we don't agree with this—but the three drawings below are the exception to the rule. Look them over and see for yourself exactly how Wolverine Trufin Type S/T can help you improve heat transfer performance.

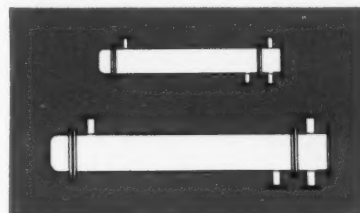
**This much Trufin has the same surface area as this much plain tube...**



**Which means smaller shells...**

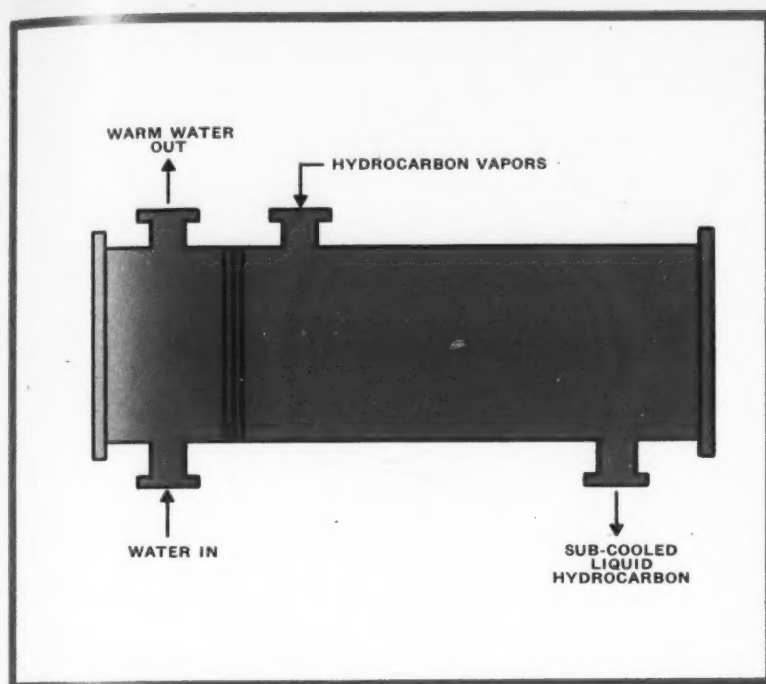


**And smaller units with greater capacity**



### NEW BOOK—FREE!

Wolverine's new "Comparative Heat Exchanger Costs Book" is well worth adding to your heat transfer file. Prepared by experts it graphically presents cost breakdowns and actual comparisons between the use of plain tube and integrally finned tube in the design of heat transfer equipment. Write for your copy—TODAY!



## SAVES MONEY, TOO:

# Use of WOLVERINE TRUFIN® Boosts Condenser Heat Load

By Ernest Dodd

Throughout industry—wherever heat transfer is a necessity—more and more engineers are finding that the answer to increased heat transfer performance lies in the use of Wolverine Trufin Type S/T—the integrally finned condenser tube.

As another perfect example of this, consider the results obtained by processing engineers in a large Eastern refinery, when they retubed a hydrocarbon side cut condenser with Wolverine Trufin Type S/T.

In its prime surface form the unit required 476 tubes ¾" O.D. in 16' lengths. When retubed with Trufin Type S/T, exactly the same number of tubes of the same length and O.D. were used. Heat duty, however, immediately shot up by 30 to 35%—a gratifying increase indeed.

There is no particular secret or magical formula connected with Trufin's ability to extract more BTU's per foot of tube. Its success is in its extended surface—gained through its integral fins which are actually extruded from the tube wall. Because of these fins, Trufin has approximately 2½ times more outside surface area than does an equivalent

piece of plain tube. More outside surface area, of course, means that you can pack more heat transfer surface into a given space thus boosting the heat performance of existing units.

In addition to boosting capacity, Trufin Type S/T also saves you money. Because it is completely interchangeable with plain tube there is little unit modification required—you simply insert Trufin condenser tubes into the bundle and roll it into the tube sheet in the regular manner, using standard tools and retubing techniques.

Here's a sure-fire method for boosting throughput, saving space and cutting costs—all at the same time.

If your company hasn't as yet used Wolverine Trufin Type S/T condenser tubes why don't you suggest them.

CALUMET & HECLA, INC.  
CALUMET DIVISION  
WOLVERINE TUBE DIVISION  
FOREST INDUSTRIES DIVISION  
CALUMET & HECLA  
OF CANADA LIMITED  
CANADA VULCANIZER AND  
EQUIPMENT COMPANY LIMITED



## WOLVERINE TUBE

Division of Calumet & Hecla, Inc.  
17234 SOUTHFIELD ROAD • ALLEN PARK, MICH.

Manufacturers of Quality Controlled Tubing and Extruded Aluminum Shapes

PLANTS IN DETROIT, MICHIGAN AND DECATUR, ALABAMA.  
SALES OFFICES IN PRINCIPAL CITIES.

EXPORT DEPARTMENT, 13 EAST 40TH STREET, NEW YORK 16, NEW YORK



# Believe it or not... it's integral!

Varying temperatures... fluctuating pressures... constant vibration. None of these can affect the inherent stability of Wolverine Trufin—the one-piece, finned condenser tube.

The fins of Trufin are squeezed right from the tube wall, are completely integral with the tube itself. That means longer on-stream time—more "mileage" when the going is tough.

Trufin can step up the capacity of your existing unit, when revamping, or can permit the design of a smaller unit (with a bigger punch!) when new heat exchangers are considered. Replace prime surface tube with Trufin Type S/T (low finned) in water-cooled condensers. Specify Trufin Type H/R (high finned) for air-cooled applications. Investigate the Trufin story—NOW! Write for the Trufin Catalog.

Wolverine Trufin is available in a wide range of sizes and types in copper, copper-base alloys, aluminum and electric-welded steel.

*Wolverine Trufin is available in Canada through  
the Unifin Tube Company, London, Ontario.*

BUY WOLVERINE TUBE—IT'S MADE IN AMERICA

CALLUMET & HECLA, INC.

CALLUMET DIVISION  
WOLVERINE TUBE DIVISION  
FORECAST INDUSTRIES DIVISION  
CALLUMET & HECLA  
OF CANADA LIMITED  
CANADA WELDING AND  
EQUIPMENT COMPANY LIMITED



WOLVERINE TUBE

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Manufacturers of Quality Controlled Tubing and Extruded Aluminum Shapes

PLANTS IN DETROIT, MICHIGAN AND DECATUR, ALABAMA

SALES OFFICES IN PRINCIPAL CITIES

EXPORT DEPARTMENT: 10 EAST 10TH STREET, NEW YORK 16, NEW YORK

**Process may cut price  
of transistor-grade  
silicon**

Product has boron impurities  
as low as 2 parts per billion

New process has been developed for manufacturing ultra-pure silicon for electronic applications. This silicon has boron impurities as low as two parts per billion and electrical resistivities as high as 400 and 500 ohm cm.

Process consists of reducing silicon tetrachloride with sodium, potassium, lithium, or some other reducing agent. Product is then "grown" into crystals of about 100 grams each, which in turn are sliced into waffles useable in electronic devices, such as transistors, rectifiers, and diodes.

The tetrachloride is made from a commercial grade ferro-silicon, which is abundantly available at less than \$1 per pound, and chlorine, at a few cents per pound. Sodium currently costs less than 25 cents per pound. The ultra pure silicon so obtained presently sells for \$250 to \$350 per pound.

It is hoped that the new process may drop price of transistor-grade silicon to below \$150 per pound by 1960 and below \$100 by 1965.

(Based on paper delivered at 16th International Congress of Pure and Applied Chemistry in Paris, France, by Dr. Robert S. Aries, Aries Laboratories, 272 Park Ave., New York, N. Y.)

Check 1929 opposite last page.

**ASTM proceedings**

Accomplishments of the American Society for Testing Materials for year 1956 are recorded in 1510-page volume. Eighty technical committee reports with appendices and 52 technical papers with discussions are included. To obtain "1956 Proceedings", remit \$12.00 direct to American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pennsylvania.

Check 1930 opposite last page.

NOVEMBER 1957

*The newest addition to the Milton Roy line of controlled volume pumps has a leak-proof diaphragm liquid end on the left and an enclosed Polar-Crank drive.*



## INTRODUCING!

### Milton Roy's Diaphragm Pump and Polar-Crank Drive

Custom built for chemical process industries, the new Milton Roy Controlled Volume Diaphragm Pump will meter liquids accurately against pressures to 2,000 psi and at rates to 400 gph. To prevent leakage, diaphragms separate the displacement chamber and the reciprocating plunger. Because of this leakproof feature, this pump provides maximum flexibility in metering toxic or other chemicals such as mercaptans.

This latest Milton Roy Pump is available with the new Polar-Crank drive, which permits adjustment of the stroke for 0 to 100% capacity changes while the pump is actually metering chemicals. A totally-enclosed unit, this drive is easily coupled with flow-rate indicating, recording or totalizing instruments.

Diaphragm liquid ends are also available on Milton Roy Company's established line of motor-driven controlled volume pumps with screw adjustment of stroke length. See them at the Chem Show in New York.

Milton Roy Company, 1300 East Mermaid Lane,  
Philadelphia 18, Pa. *Engineering Representatives  
throughout the world.*

See our new  
diaphragm pump at  
BOOTH No. 610  
26th Exposition of  
Chemical Industries  
The Coliseum, N.Y.C.  
December 2-6, 1957



Controlled Volume Pumps • Quantichem Analyzers  
Chemical Feed Systems • Anders Air and Gas Dryers

Check 1931 opposite last page.



## Colorimeter serves operator as "continuous lab technician"

**In-line recording instrument achieves closer  
control during blending of intermediate  
sugar liquors**

**DR. CHESTER KEAN and HOWARD M. BAUSERMAN**  
Technologists, C and H Sugar Refining Corp.  
With CP Staff

**Problem:** In the "liquor gallery" on the 5th floor of the C and H Sugar Refining Corporation's Crockett, California, plant (largest cane sugar refinery in the world), an operator ranges up and down a series of stainless steel flumes. His job is to shunt the various sugar liquors into proper channels as they come from decolorizing bone char filters. Color is determining factor for diverting most liquor streams into respective channels.

At this station, production of intermediate liquors is controlled so as to give a product of uniform color. Operation involves blending of light and dark colored liquor streams to produce desired color.

Years ago, when barrier layer photo cells were first available, research staff at C and H Refining designed and built a continuous indicating colorimeter. Operator referred to this instrument as he adjusted flow of light and dark liquors.

Finally as the years passed, it became more and more difficult to service and repair the old equipment. At the same time, newer — and more efficient — recording instruments had been developed. Recently, C and H technical personnel desired an even closer control than afforded

by the old indicating colorimeter.

**Solution:** A new colorimeter was added to line carrying the blended sugar liquor from the "liquor gallery." Assembly is composed of color sensing element, amplifier, and potentiometer recorder. Color sensing element has a sample cell one centimeter in depth, light source,

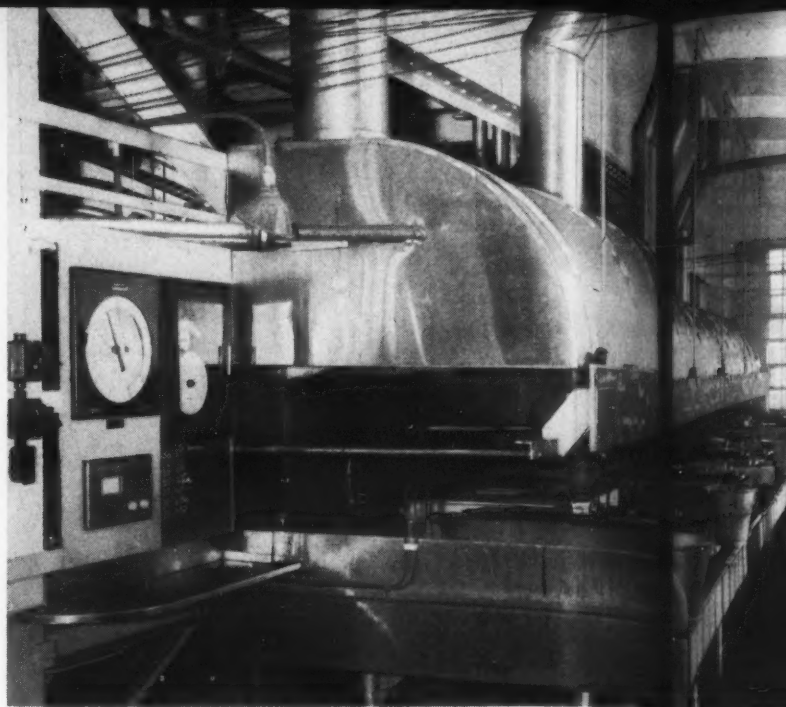
and a phototube.

A portion of blended sugar liquor stream flows continuously through the cell, which is between light and phototube, proportionately reducing amount of light energy falling on tube.

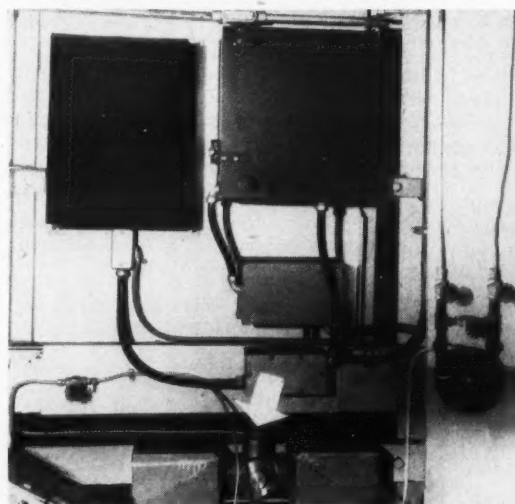
Signal from phototube, which is proportional to amount of light transmitted through sample, is

recorded as percent transmittance. Recording is indicative of sample color.

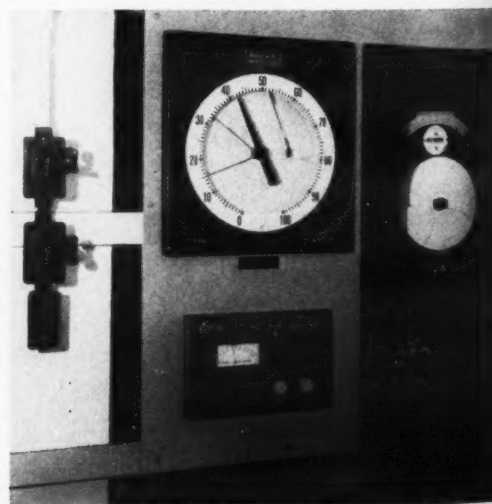
**Results:** Operator, in effect, has a "lab technician" continuously working for him. Up-to-the-minute information on blended sugar liquor color is always before him, and he does not have to rely upon his mem-



Recording colorimeter is shown at left in this view of portion of "liquor gallery" at C and H Sugar Refining Corp. Intermediate sugar liquors from bone char columns are controlled through pipes and flumes below stainless steel hood



A portion of blended sugar liquor flows continuously through cell (arrow) between light and phototube



Rear view of panel shows compactness of installation. Sensing element containing phototube is at bottom, with amplifier and recorder directly above

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ory for control. When needle of recorder begins to move in one direction, he can immediately change flows of streams to hold desired range.

Quality control department has a continuous record of these blended sugar liquor colors, making sure that only uniformly colored liquors are produced. Subsequent processing operations are speeded up, less attention is required, and a better, more uniform product is assured. Ultimately, signal from phototube may control automatic blending of light and dark colored liquors.

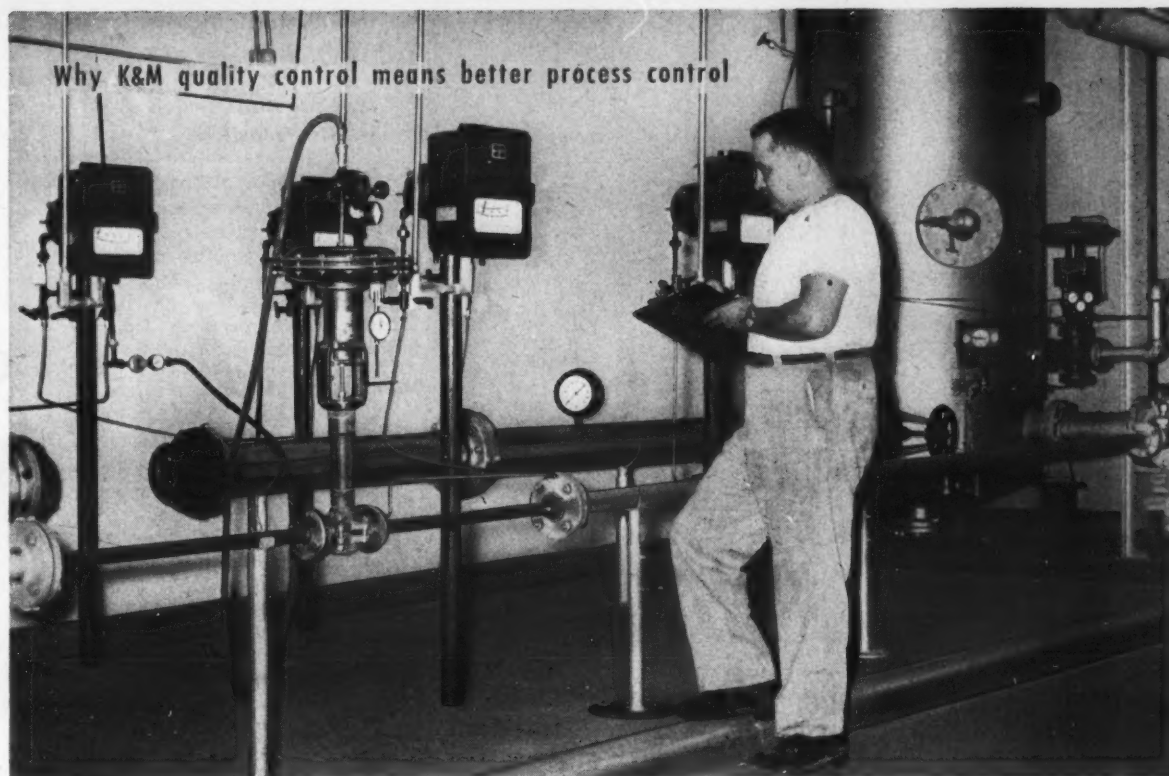
(Flow colorimeter is product of Process Instrument Division, Beckman Instruments, 2500 Fullerton Rd., Fullerton, California.)

Check 1932 opposite last page.

#### Details flow-rate meter

Rotameter with highly readable 150 mm scale is described in two-page bulletin. Specs, capacity, dimension data are included. Bul 121—Brooks Rotameter Co., Lansdale, Pennsylvania.

Check 1933 opposite last page.



## ANY FLOW . . . 0 TO 4000 GPM K&M's new lab provides accurate data for more precise valve specifications

Thorough testing under simulated on-stream conditions enables K&M to give you *realistic* valve performance specifications . . . *reliable* data based on actual observation. No guesswork . . . no maybe's.

At K&M's newly enlarged fluid dynamics lab, engineers can take simultaneous flow and pressure-drop readings at any desired flow rate up to 4000 GPM, under pressure heads of up to 225 ft. of water. In-the-line response characteristics are

thus made accurately predictable.

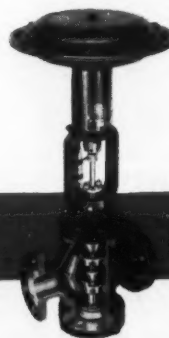
The flow test laboratory is but one part of a continually expanding quality control program that now includes radiographic inspection, high-temperature leak testing and spectrometric analysis of critical valve assemblies.

When it comes to fluid control, why don't you, too, come to K&M . . . where the highest standard of workmanship is always an unwritten specification.

# K&M

diaphragm control valves

Our 78th Year

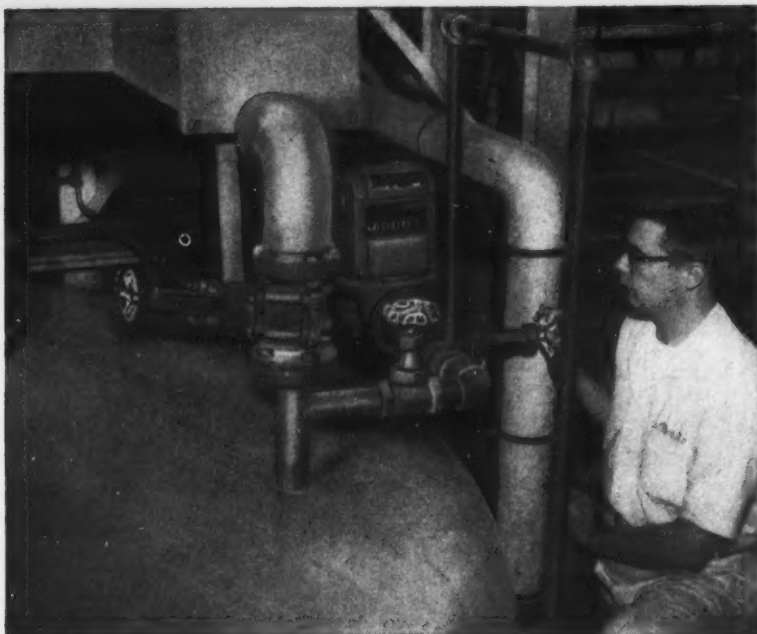


## KIELEY & MUELLER, INCORPORATED

Oldest Pressure and Level Control Valve Manufacturer

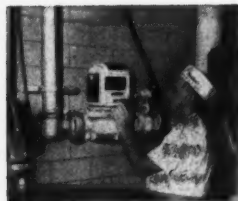
64 Genung Street, Middletown, New York

Check 1934 opposite last page.



Stop costly giveaways...  
Stop down-the-drain losses with

## NEPTUNE *Liquid* METERS



**IN ICE CREAM TOO**—this ice cream plant gets taste-control by metering to make sure exactly the right amount of corn syrup goes into the mix. Operator simply presses buttons on the Neptune Auto-Stop to set the amount of corn syrup to be delivered... opens the valve... and the meter shuts off automatically. Ticket printing meters also available.

Sizes from  $\frac{3}{4}$ " to 6", 2 to 1000 gpm. for handling over 150 liquids.

Get built-in cost control with Neptune meters... like this Stein-Hall plant making liquid adhesives. They always *know* how much water and vinyl acetate is used... and, hence, how much their product costs. The meter doesn't forget, doesn't get tired and doesn't mis-count.

Besides controlling costs with their Neptune meters Stein-Hall now gets consistent quality control of each batch of adhesive. No more rejected batches.

Ask for helpful  
Metering Bulletin  
566-BP



### NEPTUNE METER COMPANY

19 West 50th Street, New York 20, N. Y.



Branches ATLANTA • BOSTON • CHICAGO • DALLAS • DENVER • LOS ANGELES  
in: LOUISVILLE • No. KANSAS CITY, Mo. • PHILADELPHIA • PORTLAND, ORE.  
SAN FRANCISCO (Millbrae) • IN CANADA: TORONTO 14, ONT

Check 1935 opposite last page.

## INSTRUMENTATION

### Low-pressure switch is ultra-sensitive

Differential pressure of  
0.1 inch water can actuate

**Uses:** Controlling movement of roll-type air filters, pressure regulation of gas boosters, switch operation of dampers, blowers, gas-fired heaters, other low-pressure control, safety or signaling applications.

**Features:** Low-pressure switch is ultra-sensitive. Pressure difference of 0.1" water may actuate contacts.

**Description:** Pressure, vacuum, or differential pressures will operate switch. Normal range is 0.1" water to 5.0" water. "Make" and "break" contacts are adjustable to any point within the limits. Switch can be mounted in any position. Operation is not affected by vibration. Instrument requires only  $1\frac{1}{2}$ " head room and fits in area of  $3\frac{1}{2} \times 7\frac{1}{2}$ ". Since there is no flow through sensing element, connecting tubing may be as small as  $\frac{1}{8}$ " ID.

Switch is designed for use on AC or DC, with maximum potential of 110 volts. Circuit is NO or NC, as desired.

(Low-pressure switch is product of Bacharach Industrial Instrument Co., 200 N. Braddock Ave., Pittsburgh 8, Pa.)

Check 1936 opposite last page.

### Gives rapid response to low-level signals — opens, closes valves

Actuator easily mounts on  
sliding-stem valves

**Uses:** From signals supplied by controllers, operates remote positioning devices. Or, directly from measuring elements, will open and close valves in either closed or open loop systems.

**Features:** Self-contained valve actuator easily mounts on any sliding-stem valve having from  $\frac{1}{2}$ -to  $1\frac{1}{2}$ -inch stroke and requiring less than 200-lb thrust. Electro-hydraulic operation assures fast

Have to  
**MATCH COLORS**  
Exactly?

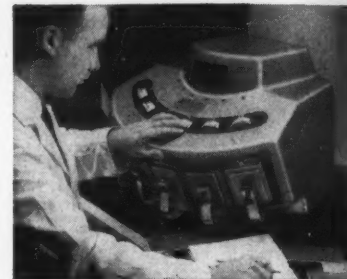


DEPEND ON

**FISHER**  
DAVIS-BRUNING

## COLORIMETER

THE COLOR MEMORY FOR INDUSTRY



Have to get a color exactly? And keep it once you have it? Fisher Scientific's development engineers have found the answers in the Davis-Bruning Colorimeter. It translates any color, in any product, into a permanent numerical formula that can be converted back into the original color whenever an exact re-match is wanted. The Colorimeter has broad applications in paint, food, textile, paper, plastics, printing, ceramics and other fields requiring exact color control.

**Stops Color Drifting**

**Standardizes by Formula**

**Eliminates Long Calculations**

**Measures Color Differences**

**Tests Color Blindness**



B-36a

### WANT TO KNOW MORE?

Send for the 8-page booklet which details the how and why of the Davis-Bruning Colorimeter. You'll find it helpful.

103 FISHER BLDG., PITTSBURGH 19, PA.



**FISHER**  
**SCIENTIFIC**

IN THE U.S.A. Chicago Philadelphia IN CANADA  
Boston Cleveland Pittsburgh Edmonton  
Buffalo Detroit St. Louis Montreal  
Charleston, W.Va. New York Washington Toronto

America's Largest Manufacturer-Distributor of  
Laboratory Appliances & Reagent Chemicals

Check 1937 opposite last page.

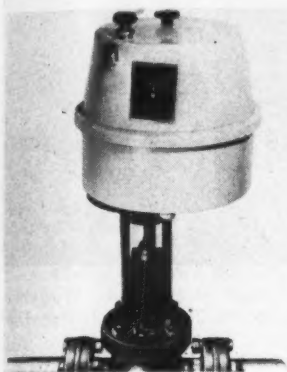
CHEMICAL PROCESSING



## INSTRUMENTATION

response and stability.

**Description:** Device operates from low-level DC or AC input signals. Standard signal range is from 1 to 5, or from 4 to 8 milliamperes DC. Internal rectifier is supplied for AC signals.



Valve actuator operates hydraulically from low-level DC or AC input signals

Electrical connections comprise only two signal wires and two wires for power supply.

(Electrohydraulic valve actuator is manufactured by Askania Regulator Co., a subsidiary of General Precision Equipment Corp., 240 E. Ontario St., Chicago 11, Ill.)

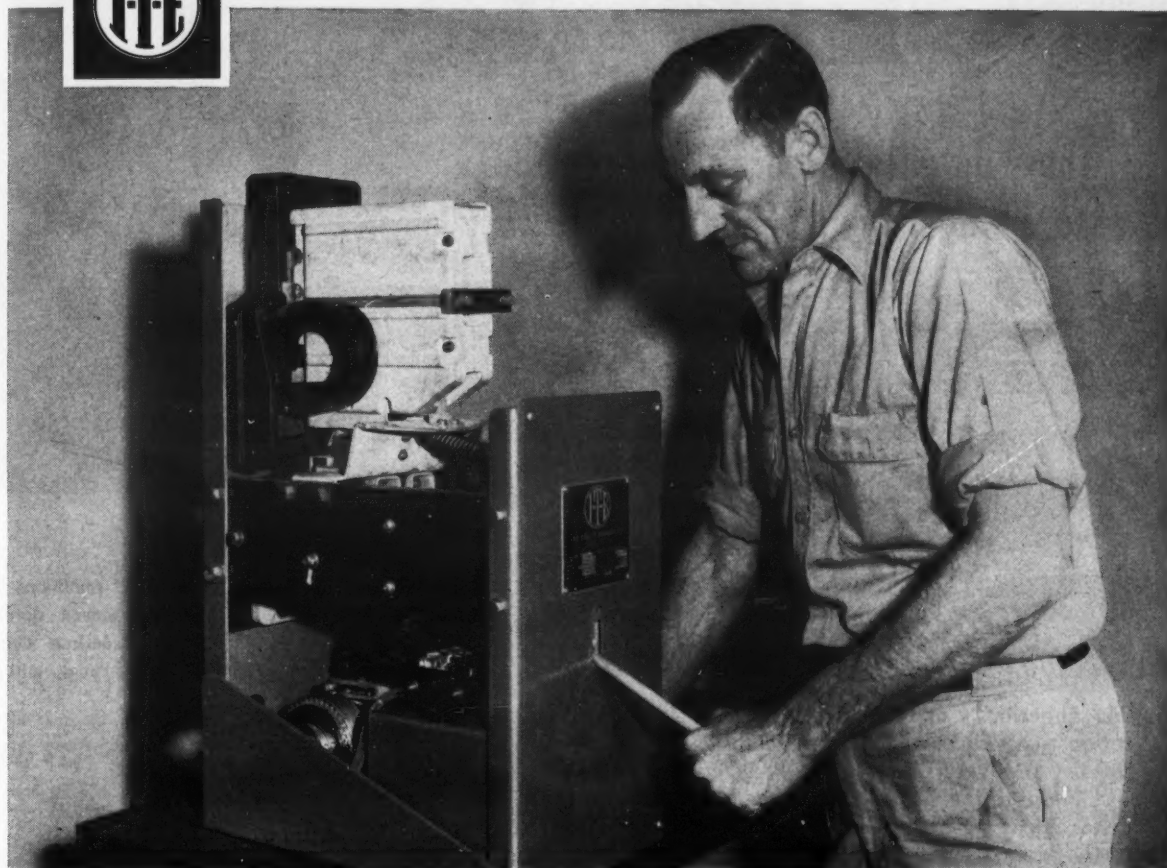
Check 1938 opposite last page.



"If I hit it right here the oil pressure drops..."



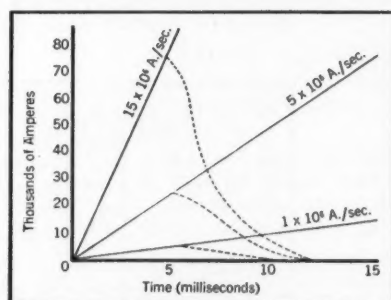
## D-C CIRCUIT BREAKERS



Type FB-20 single pole circuit breaker; 2000 amperes continuous, 1000 volts d-c.

## NEW "FB" CURRENT LIMITING CIRCUIT BREAKER

Now...complete current limiting protection against fault currents of 1000 to 150,000 amperes



Peak let-through current for FB circuit breaker with 1000 ampere trip.

Visit the I-T-E exhibit at the 26th Exposition of Chemical Industries Dec. 2 to 6, N.Y. Coliseum

**I-T-E CIRCUIT BREAKER COMPANY • Switchgear Division**  
IN CANADA: EASTERN POWER DEVICES LTD.

Small in size, these FB d-c circuit breakers with fast current limiting action provide a tremendous protective capacity. In the event of a fault, powerful springs open the contacts before the current has a chance to rise to its maximum potential.

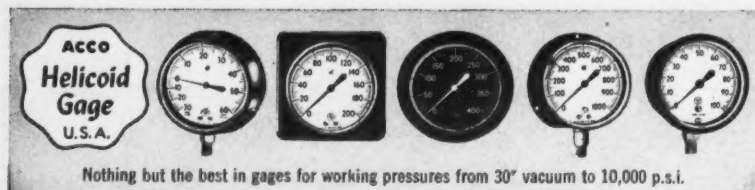
Even in circuits where the rate of rise might approach 15,000,000 amperes per second, let-through current will not exceed 80,000 amperes. In most applications, it will never exceed 30,000 amperes—and total interrupting time is only 12 milliseconds. This quick action reduces the magnitude and duration of fault currents—thus eliminating mechanical failures and heat damage.

FB circuit breakers are available in either single or double pole models and with continuous current ratings of 1200, 2000, 3000 and 5000 amperes and up to 1000 volts d-c. They are available with either stationary or drawout mounting. Write for Bulletin 3004-A. I-T-E Circuit Breaker Company, Switchgear Division, 19th & Hamilton Sts., Philadelphia 30, Pa.

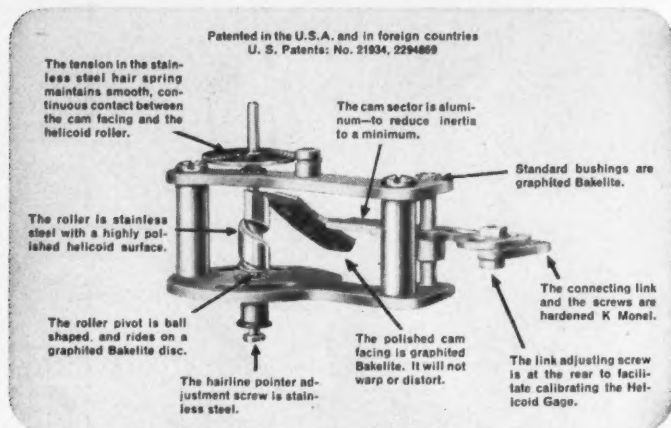


Check 1939 opposite last page.





## These details of Helicoid gage design assure longer life and enduring accuracy



The superiority of Helicoid Gages is most evident in severe service—wherever a gage is subjected to violent pressure pulsations or severe mechanical vibrations.

The *sustained accuracy* of Helicoid Gages over millions of cycles is explained by the details of design and construction of the Helicoid movement shown above. Such Helicoid features—protect against wear and corrosion and assure sensitivity, sustained accuracy and trouble-free operation.

### The Chemical Gage

The Helicoid Chemical Gage has a guaranteed accuracy of plus or minus 1%. It is applicable for working pressures from 30" vacuum to 5000 p.s.i. and temperatures to 400° F. It is particularly suitable for chemicals and other viscous fluids which might clog or corrode a Bourdon tube. Pressure and/or vacuum is transmitted directly to the indicating gage element through deflection of a Teflon or Kel F sealing diaphragm.



### Tubes built for millions of pressure pulsations

To fit the wide range of applications, Helicoid Bourdon tubes are available in four materials—alloy steel, K Monel, stainless steel and phosphor bronze.

All Helicoid tubes are made from seamless tubing and are carefully designed to give maximum torque and minimum stress. When used within the dial range, they will withstand many millions of pressure pulsations and will not stretch, leak or crack.

For complete information on the Helicoid line of gages write for Catalog G-52

Helicoid gives you all these features at prices that are competitive in the quality gage field.

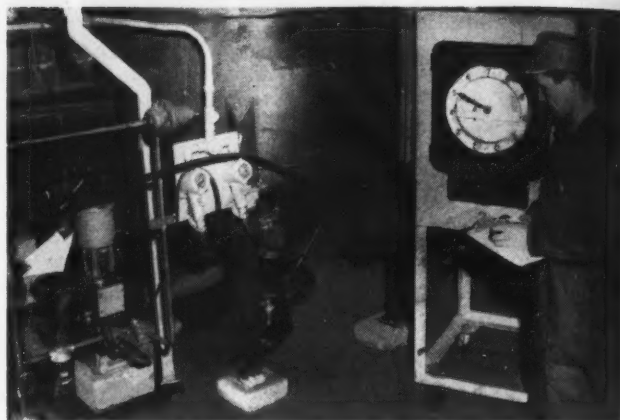
**Helicoid Gage Division  
AMERICAN CHAIN & CABLE**

929-P Connecticut Avenue • Bridgeport 2, Connecticut



Check 1940 opposite last page.

## INSTRUMENTATION & CONTROL



When pH conditions in continuous nitrile process reactor proved detrimental to further process steps, American Cyanamid combined metering pump and pH meter for . . .

## accurate process pH control

**THEODORE W. WETT**

Assistant Editor

With **PAUL M. TOMPKINS**

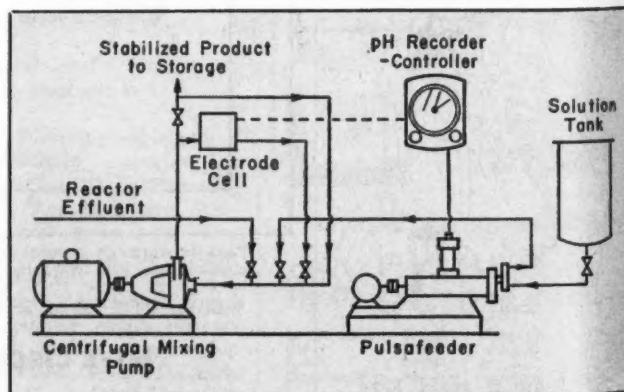
Plant Manager

American Cyanamid Co., Linden, N.J.

**Problem:** In continuous manufacture of various nitriles at American Cyanamid Co.'s Linden, N.J. plant, conditions of pH giving optimum reactor yield were found to be detrimental to product upon fur-

ther processing or storage. An immediate and continuous method of pH adjustment was needed. Product stream from reactor contained varying percentage (3-5%) of alkali carbonate. For proper results a pH of essentially seven was required before further processing.

Process was carried out in company's semi-commercial works where products are



Schematic of pH control system. A pH of essentially seven is required to assure proper storage qualities in product

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Signal from pH meter (right) adjusts length of piston stroke in metering pump (arrow) to maintain required pH in nitrile process stream at American Cyanamid

produced for sales evaluation. Works is larger than pilot plant and designed for process flexibility. Materials already developed are produced in quantities ranging from a 500-lb batch to 250,000 lb/mo for several months until size of market can be determined and major facilities set up.

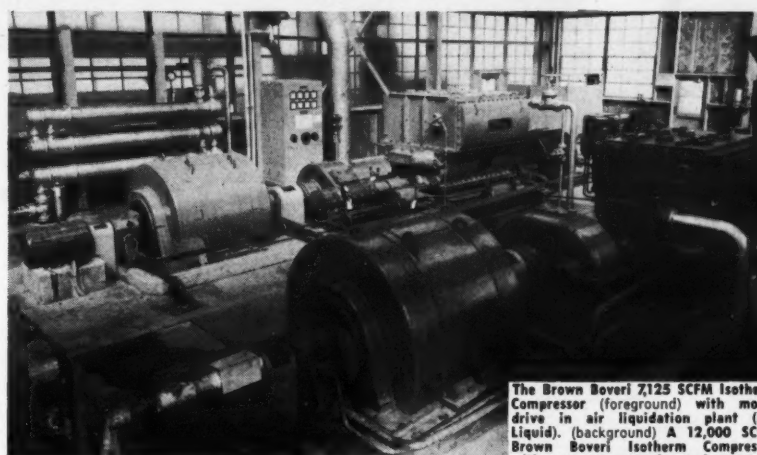
**Solution:** A small, agitated neutralizing chamber was provided in continuous reactor effluent line. Outflow from this chamber was piped through an electrode assembly of a Speedomax pH recorder-controller. Air signal from controller was tied into stroke-length adjustment mechanism of an Auto-Pneumatic Pulsafeeder pump which fed acid to neutralizing chamber.

Pump is designed for a flow maximum of 1.6 gph at 250 psig. Liquid end is entirely 316 Stainless Steel, including valves. Liquid is moved by action of a diaphragm providing positive displacement with no stuffing box. Leakage or contamination of liquid being pumped is prevented. Diaphragm movement is controlled by action of reciprocating piston on hydraulic fluid. Length of piston stroke determines volume pumped. Air cylinder which controls stroke-length adjustment mechanism responds to a 3- to 15-lb transmitted pressure signal from pH meter. Flow can be varied from 0 to 100% of rated volume.

Original installation suffered from two shortcomings: Too great a time lag between neutralization chamber and electrode assembly; and flow blockage by deposition of crystals of neutralization product and polymer present in reaction product. To overcome this, neutralization chamber was replaced by a centrifugal pump with a recirculation loop.

To next page

# If you need LARGE VOLUME\* MEDIUM PRESSURE\* Oil-Free Air-



The Brown Boveri 2125 SCFM Isotherm Compressor (foreground) with motor drive in air liquidation plant (Air Liquid). (background) A 12,000 SCFM Brown Boveri Isotherm Compressor with recovery expander and motor in Nitric Acid plant (C & I).

for SUPERCHARGING  
of a  
CHEMICAL PROCESS

for OXYGEN  
PRODUCTION

for OTHER  
CHEMICAL  
PROCESSES

## you need a BROWN BOVERI ISOTHERM COMPRESSOR

WHERE large volumes of oil-free air (5,000 SCFM and up, 100-300 PSIA)\* are required, there is no better equipment available today to achieve "close to isotherm" type of compression, assuring the lowest possible kW input, than a Brown Boveri Isotherm Compressor.

If "tail" gas is available, the high efficiency, reaction type Brown Boveri expander can be applied in the cycle with the Isotherm Compressor to improve further the economy of the process. As drive for the compressor a synchronous, induction or other type of motor, or a steam- or gas-turbine can be used.

Over half a century's background in the manufacture of this Brown Boveri equipment (including control and all accessories) is your positive assurance of the ultimate in the reliability of this "packaged" unit. Write for more information, today!

### BROWN BOVERI CORPORATION

NEW YORK 6, N. Y. • 19 RECTOR STREET

Atlanta, Ga. • Birmingham, Ala. • Boston, Mass. • Buffalo, N. Y. • Chicago, Ill. • Cleveland, O. • Dallas, Tex. • Denver, Colo. • Detroit, Mich. • Hamilton, O. • Jacksonville, Fla. • Kansas City, Mo. • Knoxville, Tenn. • Miami, Fla. • Minneapolis, Minn. • New Orleans, La. • New York, N. Y. • Pasadena, Cal. • Pittsburgh, Pa. • Portland, Ore. • Roanoke, Va. • San Francisco, Cal. • San Juan, P. R. • Syracuse, N. Y. • Tucson, Ariz.



Check 1941 opposite last page.



**pH Control***From preceding page*

**Results:** Installation gives immediate response and accurate neutralization of process stream. Velocity is high enough to keep inorganic salts and solid polymers in suspension. Product is satisfactorily stabilized for further processing or storage.

(pH meter supplied by Leeds & Northrup Co., 4934 Stenton Ave., Philadelphia 44, Pa.)

Check 1942 opposite last page.

(Metering pump is a product of Lapp Insulator Co., Inc., Le Roy, New York.)

Check 1943 opposite last page.

**Meter-relay**

Bulletin of 12 pages describes meter-relays for thermistor and thermocouple temperature control. Typical circuits are described with schematics included. Units described can be either current or voltage sensitive. Bul 104-A — Assembly Products, Inc., Dept. CP, PO Box XX, Palm Springs, Calif.

Check 1944 opposite last page.

**Mercury-less flow meter has over-range protection**

Preformed diaphragms stack together

**Uses:** As differential-pressure diaphragm flow meter.

**Features:** Diaphragm meter uses preformed sensitive diaphragms, stacked to nest together for positive over-range protection.

**Description:** Diaphragm flow meter is available in differential ranges of 0 to 20, 0 to 50, 0 to 100, and 0 to 200 inches of water. Each pair of diaphragms forming low-pressure (range) and high-pressure (compensating) diaphragm elements is welded in place. Over-range pressure on either element forces filling fluid through a connecting passage, around an adjustable damping plug, and into opposite element. Unit under pressure compresses so that spacing rings form a metal-to-metal column. Each

# Try this Taylor answer for tough NO POCKETING...NO PURGING

**TYPICAL APPLICATIONS**

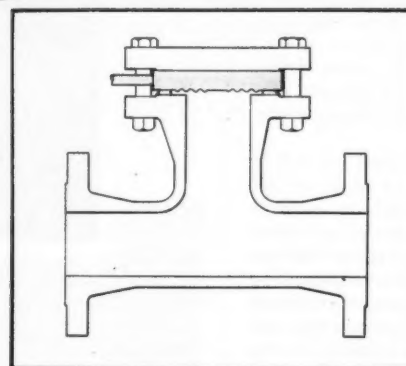
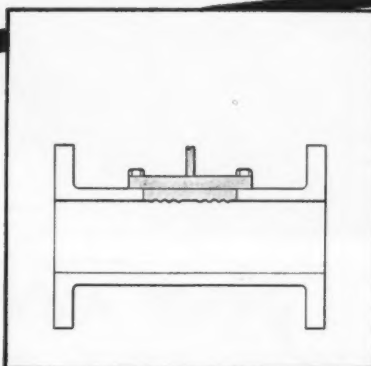
**Flow Measurement of** • Salt Slurries  
• Viscose • Liquid Sulphur  
• Sulphuric Acid • Caustic Solutions  
• Pulp Solution • HF Alkylation

Taylor furnishes all required types of differential producing devices—including concentric, eccentric, segmental or

quadrant orifice plates.

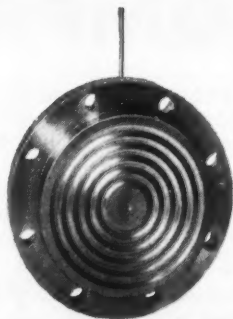
**Level Measurement on** • Caustic Evaporators • Emulsified Asphalt Storage Tanks  
• Batch Stills • Pharmaceutical Crystalizers

**Differential Pressure Measurement**  
• Fractionating Columns • Pumps • Filters



**Type 95 flange (left)**, for use with chemical tee. For flow installations where diaphragm is flush with the inside of pipe, so that process fluid imparts a scouring action. Also for liquid level requiring flush installation. Maximum pressure 300 psi.

**Wafer type sensing element (right)**, for use with standard 3" ASA flange, where diaphragm need not be flush mounted, e.g., corrosive flow or liquid level measurement. Standard diaphragm material, for both types, 316 Stainless Steel; alternates available. Maximum pressure 1500 psi.



## Taylor Instruments



# Flow and Level measurement...

## ...NO PLUGGING... WITH THE NEW

### 205T VOLUMETRIC DIFFERENTIAL PRESSURE TRANSMITTER

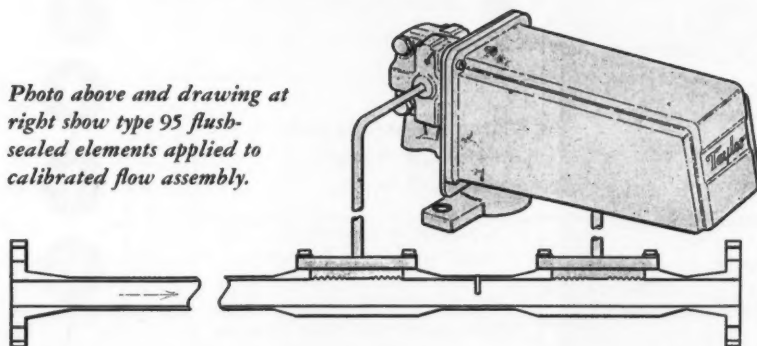
Here at last is an economical way to eliminate purge and seal problems. The Taylor 205T Flow and Liquid Level Transmitter never has to be purged of deposited material and never suffers from corrosion, because it is completely isolated from the process material. The pressure-sensitive diaphragms may be installed flush with the inside of the pipe or tank in a variety of mountings. The temperature limit is 300°F. at the diaphragms.

Accurate, sturdy, dependable and low-cost, this latest addition to the Taylor family of transmitters can solve your most difficult flow and liquid level measurement problems. Ask your Taylor Field Engineer for full details, or write for **Bulletin 98281**.

Taylor Instrument Companies, Rochester, N.Y., or Toronto, Canada.



Photo above and drawing at right show type 95 flush-sealed elements applied to calibrated flow assembly.



VISION • INGENUITY • DEPENDABILITY

## MEAN ACCURACY FIRST

Check 1945 opposite last page.

#### INSTRUMENTATION

pair of diaphragms is nested, preventing over-range damage.

Bi-metallic compensator inside high-pressure element varies fluid capacity according to temperature changes to reduce temperature variations. Low-pressure element is connected to a bellows-sealed drive arm, driving the indicating or recording mechanism.

Diaphragms are of 316 Stainless Steel. Body is forged steel, cadmium plated or 316 Stainless. Range spring is of Ni-Span C metal. Pressure connections are tapped for 1/4 or 1/2 inch NPT.

(Type 37 Diaphragm meter is product of the Foxboro Co., Foxboro, Mass.)

Check 1946 opposite last page.

#### Capsule pressure gage can be used for hot, viscous fluids

Unit will operate at temperatures to 500°F

Uses: For accurate and sensitive pressure control of hot liquids as asphalt, coal tars, by-product residues, and other viscous fluids.

Features: Pressure gage will operate at temperatures to 500°F. Accuracy is  $\pm 1\%$  of full scale range.

Description: Gage indicates pressure by displacement of a filling liquid into Bourdon tube. Diaphragm of gage is 316 Stainless Steel, although it can be fashioned of any metal that can be formed and welded as a capsule. Housing is furnished with either 316 Stainless Steel or malleable iron body. The 2 1/2" MNPT on body can be inserted in any type of pipe fitting. Standard dials are 3 1/2, 4 1/2, 6, and 8 1/2" in diameter. At high temperatures, maximum pressure rating is 1000 psi. At normal temperatures, maximum pressure rating is 2000 psi.

(Capsule chemical gage is product of Helicoid Gage Div., American Chain & Cable Co., Inc., 929 Connecticut Ave., Bridgeport 2, Conn.)

Check 1947 opposite last page.



MODEL  
"M"  
SERIES

**Marksman tubeless electronic potentiometer strip chart RECORDER for recording and controlling such variables as temperature, speed, strain, pH and many others.**

- ★ No vacuum tubes. Sensitivity of 5 micro-volts or less.
- ★ Potentiometer for thermocouple (TCB protected) or radiation pickup, Wheatstone bridge for resistance pickup.
- ★ Full selection of standard scale ranges . . . 11" calibrated chart width.
- ★ Selector knob changes chart speed . . . 5 speeds per unit without gear change.
- ★ Single or multi-record units available.
- ★ Equipped for 115 or 230 volts — no transformers needed.
- ★ Additional features: Automatic standardization . . . cold junction compensation for thermocouple use . . . battery condition indicator for potentiometer . . . built-in chart saver . . . designed for standard 19" relay rack.

**WEST Instrument CORPORATION**  
SALES OFFICES IN PRINCIPAL CITIES

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British Plant: WEST INSTRUMENT LTD.  
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Represented in Canada by Upton, Bradeen & James

NOW you can have all these practical advantages in a single instrument. Write for Bulletin M.

the trend is to WEST



Check 1948 opposite last page.

## INSTRUMENTATION

**Detects moisture build-up in pneumatic-operated instrumentation**

Warning system detects humidity, actuates alarm

**Uses:** Detecting build-up in air lines of pneumatically-operated instruments. System detects unfavorable moisture build-up, when humidity approaches danger limit, and actuates an alarm.

**Features:** Humidity controller is automatic in operation and does not need constant re-calibration.

**Description:** Dew-point monitor system includes humidity controller containing a sensitive electronic switch that actuates an alarm, plus a plug-in sensing element.

Sensing element is directly installed within pressure system. It eliminates need for sampling.

Controller may be set for dew-point temperatures from  $-45^{\circ}\text{F}$  at 50 psi, or  $-60^{\circ}\text{F}$  at 150 psi to 1000 psi.

Instrument has a fail-safe alarm for protection. Control accuracy is  $\pm 1.25\%$  relative humidity. Power requirements are 115 volts, 60 cycles.

(Dew-point monitor system is product of American Instrument Co., Inc., 8030 Georgia Ave., Silver Spring, Md.)

Check 1949 opposite last page.

**Automatically logs data on storage tanks every half hour**

Continuous-supervision circuits warn of danger

**Uses:** Automatically logs liquid level and other data on storage tanks. System takes readings on 72 large tanks every half hour.

**Features:** Continuous-supervision alarm circuits in system warn of dangerously low or high levels. Printer logs these data in red.

**Description:** Control unit and electric typewriter log data from automatic level gage and pulse transmitter. Upon interrogation, transmitter

UNITIZED  
WEIGHING



for  
conveyor  
systems

Only WEIGHING COMPONENTS offers a packaged unit that:

- 1 Fits your present or proposed conveyor system with little if any modification.
- 2 Responds only to vertical weight—not affected by side thrust, load placement or pile-up.
- 3 Measures rate and/or totalizes.
- 4 Offers high sensitivity with rugged simplicity.
- 5 Has automatic tare weight adjustment.
- 6 Electrical or pneumatic operation—your choice.
- 7 Use for indicating, recording and/or controlling . . .
- 8 Highest accuracy — no knife edges, levers or springs.
- 9 Lifetime construction.
- 10 Safe for all locations.

Full information available. Send for Bulletin 11.



**WEIGHING & CONTROL COMPONENTS, Inc.**  
206-A Lincoln Ave., Hatboro, Pa.

Check 1950 opposite last page.

CHEMICAL PROCESSING

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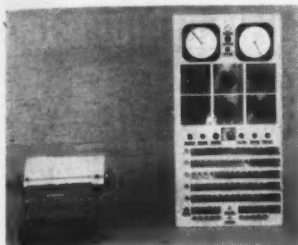
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## INSTRUMENTATION

responds with unique identification code and then sends level in feet, inches, and eighths. Bursts of fixed-width pulses are generated by cam switches and received by stepping relays. No vacuum tubes or transistors are used. All circuits are designed to "fail safe". Digital transmission up to 1000 miles over one



Electric typewriter and control unit record tank information, including liquid levels

wire (earth return) does not degrade accuracy. Telegraph-quality lines of 75 cps bandwidth are satisfactory.

Motors, valves, and actuators may be remotely supervised and controlled, if desired.

(Datalogger and Telepulse equipment is product of Electrical Division, Shand and Jurs, Dept. CP, Eighth and Carleton Streets, Berkeley, California.)

Check 1951 opposite last page.

### FOR MORE INFORMATION

Here's what to do when you want additional details about products and services mentioned in this issue's editorial articles or advertisements.

Note the number at end of article or advertisement. Check this key number on Reader Service Slip opposite last page of this issue. Fill in Slip with the other pertinent information (name, title, company, address, product made). Mail to our Reader Service Department.

We'll contact the manufacturer for you. He'll send you the details direct.

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( )	SOAP	
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Check your products on this list, then

## INVESTIGATE Rockwell-Built EDWARD VALVES

for your process!

With the frontiers of chemical research and development pushing ever outward... with new products and processes the order of the day... NOW is the time to get the help you need in valving liquids, gases and solids-in-suspension. For Edward, long-time leader in the field of cast and forged steel valves, spends *more*, proportionately, for steel valve research than any other valve manufacturer. The results of this continuing substantial investment are at your disposal. Technically trained, thoroughly experienced, your Edward Valves Representative can supply a wealth of practical information on valve selection, installation, operation, maintenance and repair. This man is at your service... a card or a call will bring him. Why not get in touch with us *today*?

**EDWARD BUILDS**... a complete line of forged and cast steel valves; from 1/4" to 18"; for pressures up to 7500 psi; with pressure-seal, bolted, union or welded bonnets; with screwed, welding or flanged ends.

- Globe Stop Valves
- Angle Stop Valves
- Gate Valves
- Non-Return Valves
- Check Valves
- Blow-Off Valves
- Stop-Check Valves
- Relief Valves
- Hydraulic Valves
- Instrument Valves
- Gage Valves
- Special Designs

In the Edward Line are valves ideally suited for services involving water, steam, air, gases, dewatering liquids, hydrocarbons, alcohols, ammonia, animal and vegetable oils, brines, caustics, solvents, sugar liquors and many other fluid substances.

## Edward Valves, Inc.

Subsidiary of

### ROCKWELL MANUFACTURING COMPANY

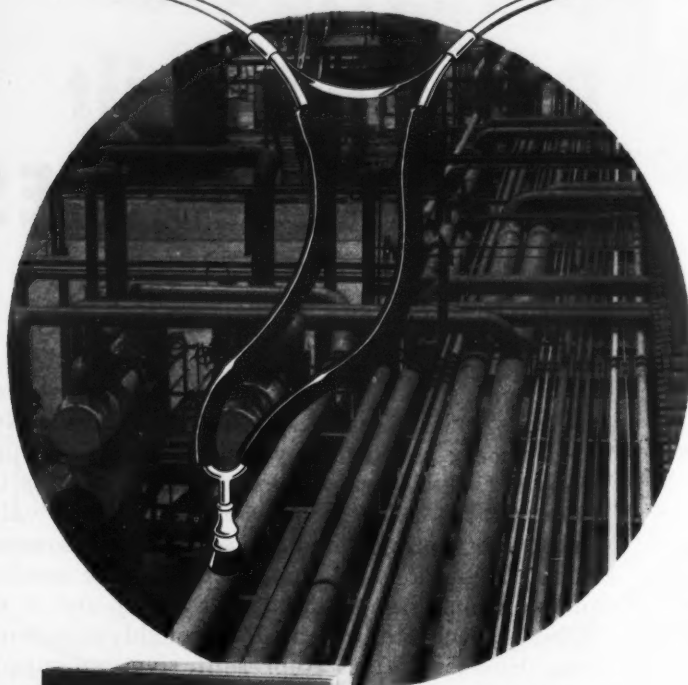


1226 WEST 145TH STREET, EAST CHICAGO, INDIANA

Check 1952 opposite last page.



## DIAGNOSE PROCESS UPSETS with Gas Chromatography



The Model 120 Industrial Gas Chromatograph automatically analyzes up to four components in single or multiple streams... continuously. This unit—as well as the Model 220, capable of analyzing up to eight components—is available in air-purgeable or explosion-proof housings.

Continuous gas chromatography is the quickest way to get an accurate picture of your process composition... an assurance of optimum production. This technique allows you to maintain correct material balance, and instantly warns you of production upsets. Eliminate the costly dangers of delayed analysis reports—use continuous 'round-the-clock chromatography for rapid, accurate stream analysis.

Visit Booth 333, Chemical Show, N.Y.C., Dec. 2-9.  
For more information about Beckman Industrial Gas Chromatography, write for Bulletin P-11-11.

**Beckman®**

Process Instruments Division  
2500 Fullerton Road, Fullerton, California  
a division of Beckman Instruments, Inc.

GAS CHROMATOGRAPHS • INFRARED GAS ANALYZERS • INDUSTRIAL pH SYSTEMS • THERMAL CONDUCTIVITY ANALYZERS  
ELECTROLYTIC HYGROMETERS • FLOW COLORIMETERS • LEAK DETECTORS • OXYGEN ANALYZERS • DENSITY BALANCES

Check 1953 opposite last page.

## INSTRUMENTATION

### Blow-proof tank gage uses manometer

Is suitable indicator for heavy liquids that congeal

**Uses:** Measuring liquid level, flow, or differential pressure. It is an effective liquid level indicator for liquids that tend to congeal.

**Features:** Manometer-type tank gage is fitted with blow-proof valve so that it is impossible to blow fluid out of manometer.

**Description:** Manometer tank gage has built-in valve which automatically closes when indicating fluid moves up in column beyond normal operating range. Valve does not weep or allow flow even when it is over-ranged ten times beyond its normal operating range.

(Levelux is product of Liquid-vision Gauge & Control Corp., PO Box 51, Oceanside, L.I., New York.)

Check 1954 opposite last page.

### Process monitor controls low moisture levels in ppm range

Measures moisture content by electrolyzing water

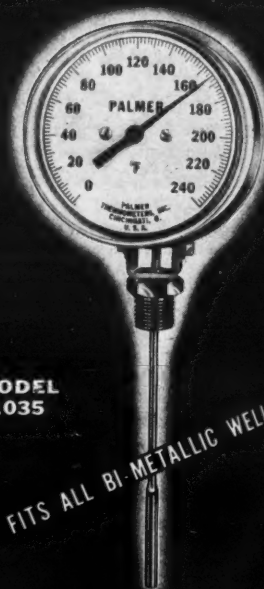
**Uses:** Recording moisture levels of feed streams in low-temperature distillation units and polymerization units. Other applications include monitoring dehydrating towers, air dryers in process plants, and measuring water-vapor content of stored gas.

**Features:** Process moisture monitor measures accurately down to less than 1 ppm. Instrument can be used for remote recording and control.

**Description:** Analysis is accomplished by continuous and quantitative absorption and electrolysis of water present in sample stream entering instrument. Electrolysis current is used as indication of water content.

Heart of instrument is electrolysis cell, in which both absorption and electrolysis take place simultaneously. Cell

## Outstanding Accuracy PALMER Dial Thermometer



MODEL  
1035

FITS ALL BI-METALLIC WELLS

Check these functional features

- Direct-drive Bourdon Coil with a filled system for longer lasting accuracy.
- Stem can be placed at any desired angle and case can be rotated to most readable position.
- External calibration for zero setting.
- Unaffected by stem alignment.
- Accurate to one scale division.
- No sticking at any temperature.
- Non-corrosive case.

**PALMER**  
**THERMOMETERS, INC.**

Mfrs. of Industrial Laboratory,  
Recording and Dial Thermometers  
2515 Norwood Ave., Cincinnati 12, O.

Check 1955 opposite last page.

CHEMICAL PROCESSING

consists of  
closely spaced  
wound in  
inner surface  
wires is covered  
film of phosphorus  
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ments. Electrode  
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Type 26-3  
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Corp., 300  
Villa, Pasadena  
Check 1956

X-ray rubber  
Four pages  
X-ray analysis  
rubber products  
with charts  
X-ray Analysis  
Rubber Products  
ments Division  
ics, Inc., 7  
Mt. Vernon  
Check 1957



"All right  
... or I'll

consists of tube with pair of closely spaced platinum wires wound in double helix on inner surface. Space between wires is coated with a viscous film of partially hydrated phosphorous pentoxide. DC voltage is applied to cell elements. Electrolysis current is monitored with a 10 or 50-mv potentiometric recorder.

Full-scale range is from less than 1 to 1000 ppm using a 5-step attenuator.

Instrument consists of analyzer unit, for installation and sampling points, and control unit which may be placed in remote control room.

Analyzer unit is weather- and explosion-proofed for outdoor installation in Class 1, Group D, Division 1 hazardous locations. Instrument operates on 105 to 125 volts, 50/60 AC.

(Process Moisture Monitor Type 26-310 is product of Consolidated Electrodynamics Corp., 300 N. Sierra Madre Villa, Pasadena, Calif.)

Check 1956 opposite last page.

#### X-ray rubber analysis

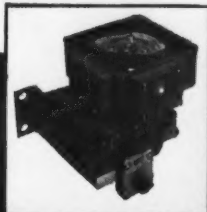
Four pages tell how to apply X-ray analysis techniques to rubber problems. Complete with charts. "How to Apply X-ray Analysis Techniques to Rubber Problems"—Instruments Div., Phillips Electronics, Inc., 750 S. Fulton Ave., Mt. Vernon, N.Y.

Check 1957 opposite last page.

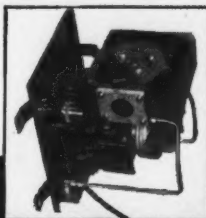


"All right Samson, move along,  
... or I'll tell her that's plastic."

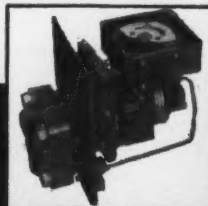
## REPUBLIC'S new family of NULL-BALANCE-VECTOR\* PNEUMATIC INSTRUMENTS



**TYPE VC**  
Control Transmitters



**TYPE VT**  
Temperature Transmitters  
Standard Range  
0-100° to 0-1000 F.



**TYPE VDP**  
Differential Transmitter  
Standard Range  
0-15 to 0-300" H<sub>2</sub>O



**TYPE VP**  
Pressure Transmitter  
Standard Ranges  
0-1.5" to 0-5000 psi

\* Design principle which permits making extremely accurate and sensitive components that are compact, versatile and interchangeable.

Republic's new line of pneumatic instruments includes pressure, differential pressure, temperature and control transmitters. Controllers that feature repeatable reset rate, less than 0.05% dead band and proportional band adjustment from 2 to 500%;—differential pressure transmitters with 20 to 1 range adjustment;—pressure transmitters of  $\pm 0.5\%$  accuracy; and temperature transmitters with 10 to 1 range adjustment show the flexibility as well as the compactness, lightweight and accessibility of these instruments.

#### THE NULL-BALANCE-VECTOR PRINCIPLE

In terms of calibration, the null-balance-vector principle means that the span of any pneumatic instrument in the line can be varied at will... merely use a screwdriver and a reference... without re-setting zero. In terms of theory, the null-balance-vector principle means that the

proportion of an input force (from a measuring bellows, bourdon tube, diaphragm, etc.) balanced by the pneumatic circuit can be varied by changing the angle at which that force acts on other links in the system. Hence, without changing air supply pressure or the measuring bellows, bourdon tube or diaphragm, the same output signal pressure range can reflect a measured input signal range that can be changed as much as 20-to-1.

Republic's new family of pneumatic instruments was developed in parallel programs that use the greatest possible number of common components. The result: High interchangeability of parts, even between instruments performing entirely different functions. Such design foresight has made the spare parts and training problems extremely simple. And Republic's null-balance-vector design means that full-range operation involves virtually no motion... and virtually no wear.

If you want the best sensitivity, accuracy and reliability in pneumatic transmitters, it would pay you to get full details on all four of Republic's new family of Null-Balance-Vector Pneumatic Instruments. Write for descriptive folios on each type, now.



## REPUBLIC FLOW METERS CO.

A Subsidiary of Rockwell Manufacturing Company

2240 Diversey Parkway

Chicago 47, Illinois

Check 1958 opposite last page.

## INSTRUMENTATION

### **Proportioning valve handles pressures to 30,000 psi**

Longitudinal stem lift provides accuracy

**Uses:** As control valve for extreme high pressure either in laboratory or process work.

**Features:** Control valve provides greater accuracy of operation by longitudinal stem lift in line with piston.

**Description:** Metering valve has removable orifice seat. When installed with line air pressure (up to 100 psi) and coupled with a Cono Control, valve can be remotely operated. It is manufactured for a range of pressures from 6000 to 30,000 psi, in sizes from  $\frac{1}{8}$  to  $\frac{3}{4}$ ". Valve can be specified to meet explosion-proof requirements. Materials available are 316 Stainless Steel, Hastelloy, and Monel metal. Unit can be supplied in a complete package, if desired, with electronic pressure-sensing device for complete automatic operation.

(High-pressure control valve is product of High Pressure Equipment Co., Inc., 1222 Linden St., Erie, Pa.)

Check 1959 opposite last page.

### **Grinding mill controller**

Control system for closed circuit grinding is briefly described in two-page folder. Application illustrations are included. Folder ND46-600-(1)—Leeds & Northrup Co., 4934 Stenton Ave., Philadelphia 44, Pa.

Check 1960 opposite last page.

### **Magnetic liquid level overcomes hazards**

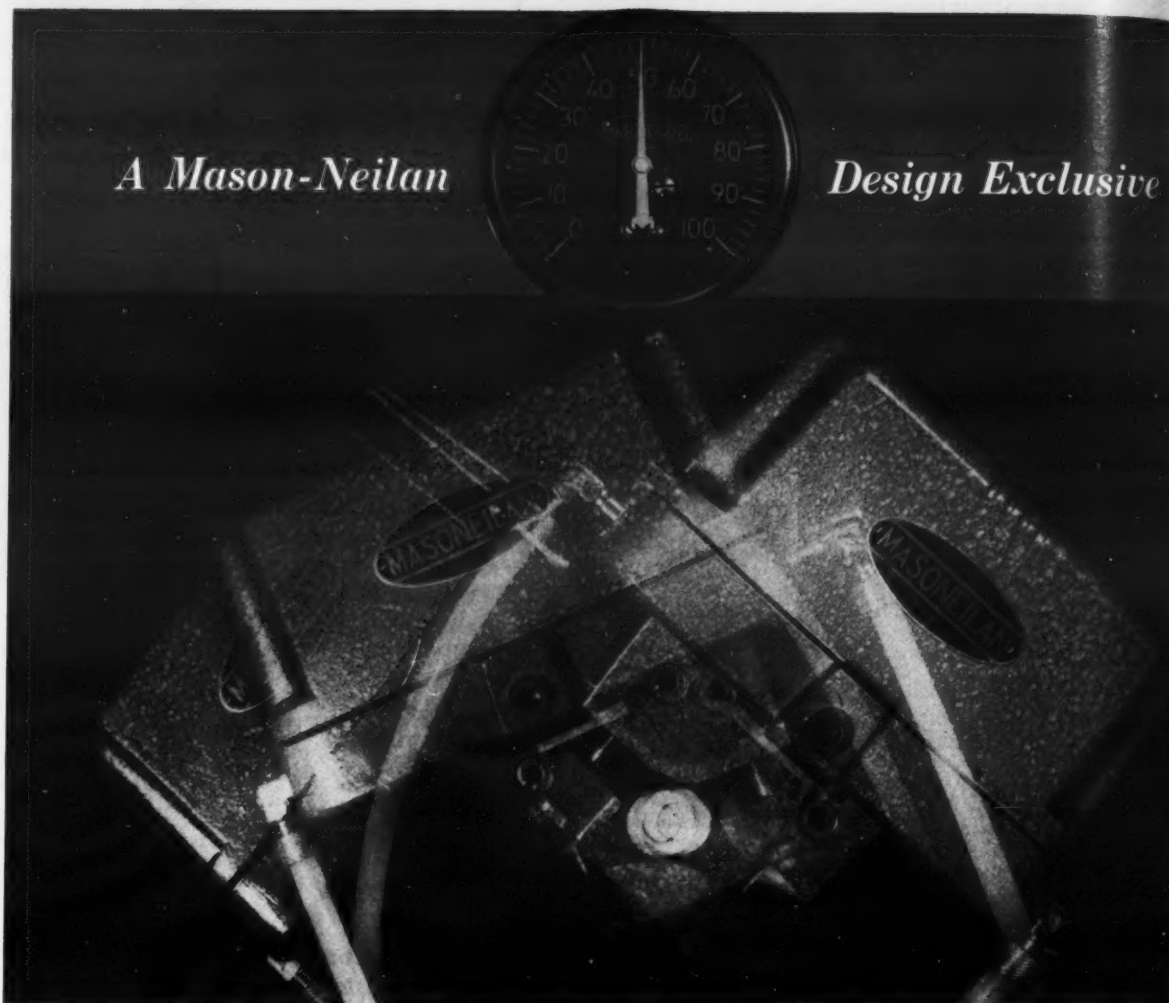
Gaging mechanism mounted outside vessel

**Uses:** Indicating liquid levels where ordinary gages with glass, gaskets, and threads cannot be used due to flammable or explosive conditions.

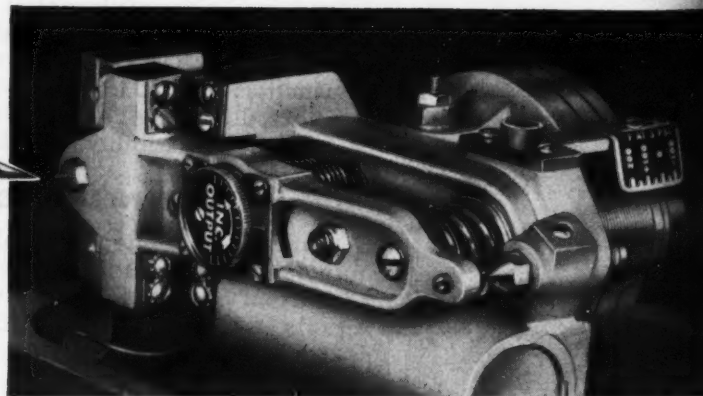
**Features:** Magnetic liquid

*A Mason-Neilan*

*Design Exclusive*



**This oscillating test mount demonstrates the effectiveness of Mason-Neilan "Balanced Beam" design. Output pressure does not change, regardless of transmitter position.**



**Balanced beam** construction also shows how the entire assembly has been compactly designed. Adjustment on front of beam provides means of synchronizing output range with the primary element span. Damage protection is provided for primary element, by beam stop and overrange feature; for compensating bellows by built-in stops; for entire unit by rugged, weather-proof case.



## Masoneilan Pressure and Temperature Transmitters use Balanced Beam to Prevent Zero Shift

*The new Masoneilan Transmitters feature a distinctive balanced beam design which eliminates positional error*

In addition, these transmitters offer several other important design advances. Unit construction simplifies change or removal of subassemblies; All adjustments are visible and accessible; Large pilot capacity insures fast operation with long transmission lines; and Unit is compensated for ambient temperature and barometric pressure.

*Write for Bulletin*

Complete information and data on

this new instrument is now available. Write for your copy or ask for details at your nearest Mason-Neilan office.

### MASON-NEILAN

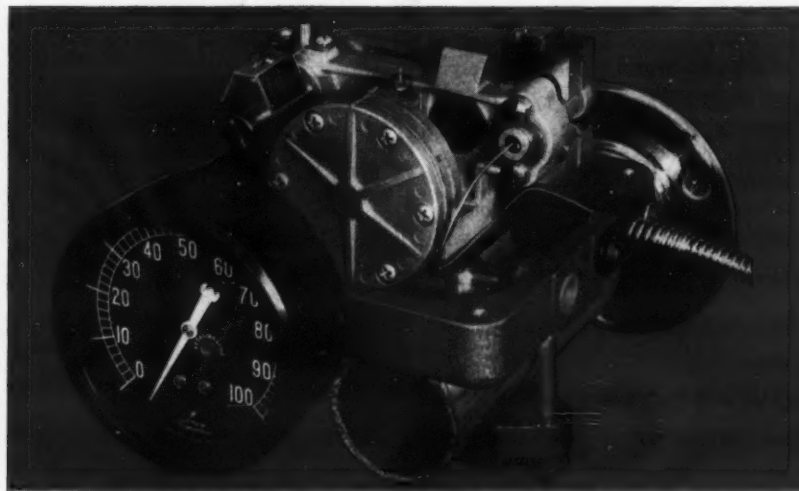
Division of Worthington Corporation  
25 NAHATAN STREET, NORWOOD, MASS.



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Appleton • Birmingham • New Orleans • Seattle • Jacksonville  
Wilmington • Mason-Neilan Regulator Co., Ltd., Montreal & Toronto



The derivative unit compensates for lags in the thermal system. It can be quickly added on the underside of base plate, and requires no tubing or fittings. Mounting block attaches to flat surface or forms clamp for pipe.



Unit Subassembly construction permits simplified removal or change of primary element; compensating bellows; feed-back bellows; pilot; range span adjustment; derivative unit; and gasketless nozzle — any or all without disturbing beam assembly in any way. Integral Receiver Gage is another Masoneilan feature — can be mounted directly on base plate without external connections.

Check 1961 opposite last page.

level gage permits gaging mechanism to be mounted outside vessel, magnetically actuating scale through chamber wall.

**Description:** Instrument consists of series of edge-magnetized wafers which are attracted to each other to give a continuous scale. One side of wafers is finished in bright red, other in silver. Changes in liquid level operate special float which turns wafers over. Thus liquid level is accurately shown on scale in a continuous red band contrasted with silver.

Magnetic gages for liquid level are built to order, to correlate factors of pressure, temperature, and specific gravity involved. Instruments are offered for pressures to 2500 psi at 600°F as liquid level gages or as indicators of interface.

(Magnetic gages are products of Jerguson Gage & Valve Co., 80 Adams St., Burlington, Massachusetts.)

Check 1962 opposite last page.

**Sensitive pick up  
has high output,  
small size**

Stainless steel unit is size of paper clip

**Uses:** Pressure transducer can be used wherever small size, high output, and great accuracy are necessary.

**Features:** Unit has accuracy



Actual size of pressure transducer is indicated by paper clip

of  $\pm 0.5\%$  full scale. Change in sensitivity due to temperature is only 0.01% per F°.

**Description:** Pressure transducers are flange-mounted. Output of unit var-

## New, Transistorized Temperature Controller



**Provides  
Much Greater Sensitivity  
Long Life, Lower Maintenance**

Use of transistors, rather than electronic tubes, in this ON-OFF signalling controller provides a tremendous increase in both the life and dependability of the instrument. Ruggedly constructed, it can withstand severe conditions of vibration and shock without loss of sensitivity or accuracy. Maintenance, naturally, is sharply reduced.

Available for either thermocouples or resistance bulbs, this transistorized controller also provides greatly increased sensitivity—acting on a temperature change of but  $\frac{1}{2}^{\circ}\text{F}$ . Use of regular A.C. line voltage eliminates the need of a standard cell and battery. **Periodic standardizing** to maintain factory accuracy of the null balance measuring circuit is **no longer necessary**. Calibration accuracy is guaranteed to within  $\frac{1}{4}$  of 1% of scale span. Scale ranges are available for all standard calibrations—covering temperatures from minus  $320^{\circ}\text{F}$ . to plus  $3000^{\circ}\text{F}$ .

**See This And Other Thermo Electric Products**

at the

**CHEMICAL SHOW—BOOTH 1111**

New York Coliseum • Dec. 2-6, 1957

**Thermo Electric Co., Inc.**

SADDLE BROOK, NEW JERSEY

In Canada — THERMO ELECTRIC (Canada) Ltd., Brampton, Ontario

Check 1963 opposite last page.

## INSTRUMENTATION

ies from 25 to 100 millivolts full scale depending on pressure range. Minimum output is 5 millivolts per volt of excitation; maximum of 10 mv per volt of excitation.

Total weight is seven grams. Flange diameter is  $\frac{5}{8}$  inch and material is 18-8 Stainless Steel.

Sensing element is four-active-arm strain gage.

Temperatures may vary from  $-100^{\circ}$  to  $+300^{\circ}\text{F}$ . Pressure ranges are from 0-3 psi to 0-300 psi with overload protection of two times stated pressure range. Units come in gage, differential, or absolute models.

(High output pressure pickup is product of Dynamic Instrument Company, 28 Carleton St., Cambridge 42, Mass.)

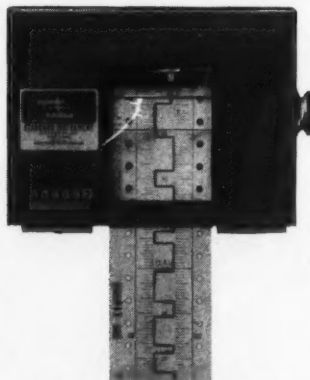
Check 1964 opposite last page.

**Continuously records  
and totalizes data  
on production**

Daily or weekly chart changes are not needed

Uses: Accumulating operation data on use of machines, processes, or systems.

Features: Daily or weekly



Window of totalizer-recorder can be lifted for notations directly on chart

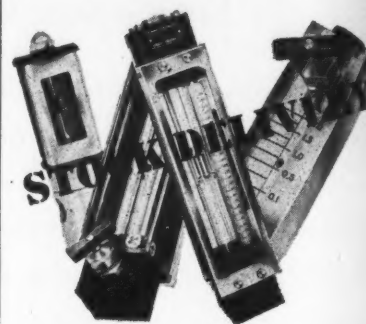
chart changes are not necessary. Instrument holds 250 feet of chart roll.

Description: Strip chart is sprocket-driven. Time totalizer registers accumulated "on"

**BROOKS LEADERSHIP**  
achieved by design

**NOW...**

**new standardization  
permits**



**of BROOKS ROTAMETERS**

A new interchangeable float design developed by Brooks brings new simplicity and practicality to rotameter instrumentation.

Now you can use the same basic metering float for flow indication . . . transmission . . . alarm signalling.

Now you can reduce spare part inventories and still have broad coverage for a variety of flow ranges and applications.

And now you can have one-day shipment of most Brooks rotameter models from delivery points conveniently located throughout the country.

If you'd like more information on this important new design achievement by Brooks, send today for Bulletin 110.

**BROOKS ROTAMETER COMPANY**



1157 A STREET,  
LANSDALE, PA.

Check 1965 opposite last page.

CHEMICAL PROCESSING

or productive time. Can be provided with operations counter instead of, or in addition to, time totalizer. Instrument does not use ink, and viewing window can be lifted up for notations directly on chart. Has chart time setting knob for external changing of chart according to time of day.

(Model SR — Recorder-Totalizer is product of Standard Instrument Corporation, Div. of Heat-Timer Corporation, Dept. CP, 657 Broadway, New York 12, N.Y.)

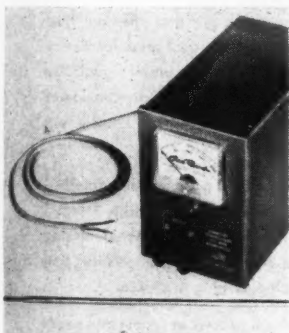
Check 1966 opposite last page.

**Hot wire anemometer is easily operated**

Constant temperature operation develops sensitivity

Uses: Measuring high-speed flow phenomena.

Features: Time-constant testing and gain setting is unnecessary, allowing automatic operation.



Hot wire anemometer operates automatically

Description: Very fine electrically-heated wire is inserted into stream. Temperature is held constant. Maximum sensitivity is thus developed with minimum wire burnout. Instrument has a frequency response to 1000 cps and noise level of less than one percent of the mean flow level.

(Constant temperature hot wire anemometer is product of Aero Research Instrument Co., 315 N. Aberdeen St., Chicago 7, Illinois.)

Check 1966A opp. last page.

## Leaders in Your Industry Have Selected "NATIONAL" as the Leader in the Field of PERFORATED APRON-TYPE CONVEYOR DRYERS



Famous names among the manufacturers and processors of chemicals, fibers and allied products are proudly listed in the growing roster of "NATIONAL" customers.

These companies, by their selection of "NATIONAL" Perforated Apron-Type Conveyor Dryers, have demonstrated their belief in the outstanding leadership which "NATIONAL" has earned in the design and construction of this and related types of drying and conditioning equipment.

AMERICAN VISCOSE CORPORATION  
ARMOUR & COMPANY  
THE PHILIP CAREY MANUFACTURING CO.  
DAVISON CHEMICAL COMPANY  
DIV. OF W. R. GRACE & CO.  
DU PONT COMPANY OF CANADA (1956) LTD.  
E. I. du PONT de NEMOURS & CO.  
THE GENERAL TIRE & RUBBER CO.  
CONGOLEUM-NAIRN, INC.

O. M. SCOTT & SONS CO.  
A. E. STALEY MANUFACTURING CO.  
AMERICAN ENKA CORP.  
NATIONAL ANILINE DIVISION,  
ALLIED CHEMICAL & DYE CORP.  
NATIONAL METAL EDGE BOX CO.  
CANADIAN INDUSTRIES, LTD.  
RADIO CORPORATION OF AMERICA  
THE DOW CHEMICAL CORP.  
CHEMSTRAND CORP.

• Watch This Space in Future Issues for Case Histories  
Send for Literature or Representative, without Obligation



LEHIGH AVENUE and HANCOCK STREET  
PHILADELPHIA 33, PENNA.

New England Agent: JONES & HUNT, INC., Gloucester, Mass. Cable Address: "NADRYMA"-W. U. Code

Check 1967 opposite last page.





## NEW LIQUIDOMETER INDICATOR

**SAVES SPACE  
ON INDUSTRIAL  
CONTROL PANELS**

### Twenty-inch dial in 3x10 1/4" case permits close readings

The new Liquidometer Model 216 Indicator gives the plant engineer a reliable, automatic reading of storage tank contents. Available in either vertical or horizontal design, the compact and highly readable Model 216 Indicator makes possible multiple installations on crowded control panels.

Teamed with Liquidometer's time-tested hydraulic transmission gaging system, the new indicator provides instantaneous remote indication of liquid levels—automatically. No outside power source is required. Virtually any liquid may be measured, and the indicator can be located up to 250 feet from the tank.

Engineered for dependability, the Liquidometer gaging systems highlight these design features:

- Maintenance free
- Integral temperature compensation
- Ease of installation—requires only one 2" diameter tank opening
- Safety—all gages Underwriters approved for hazardous liquids

For further details on the new Model 216 Indicator, write Dept. D.



**THE LIQUIDOMETER CORP.**

SKILLMAN AVENUE AT 36th STREET  
LONG ISLAND CITY 1, NEW YORK

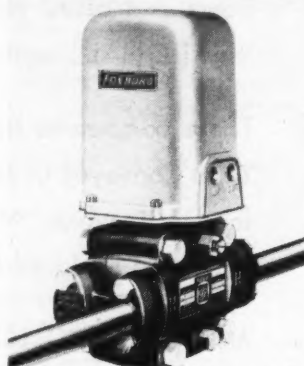
## INSTRUMENTATION

### Measures small flows below rotameter range

Transmitter is installed directly in process line

Uses: Measuring and transmitting small flows below rotameter range of clean water and similar liquids, also air and other gases.

Features: Transmitter is installed directly in a process line. It needs no separate primary device or meter leads.



Integral orifice flow meter handles small flows

**Description:** Adapted from manufacturer's d/p cell transmitter, instrument has manifold with a removable orifice through which the measured fluid flows. Resulting pressures across orifice are applied to high and low pressure sides of a standard silicone-filled, twin-diaphragm capsule. Resulting differential, balanced by a feedback mechanism, produces a 3-15 psi output signal.

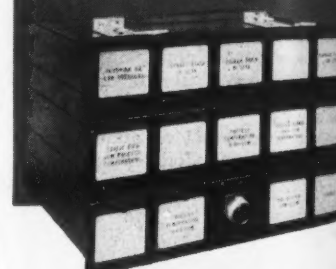
Six standard orifices in bore sizes from 0.020 to 0.250 inches are available with transmitter. Conversion kit containing set of orifices and manifold is also available for field conversion.

Transmitter range is adjustable between limits of 0-20 and 0-250 inches of water. Maximum working temperature is 250°F, maximum working pressure 1500 psi.

(Integral orifice d/p cell transmitter is product of The Foxboro Co., Foxboro, Mass.)

Check 1969 opposite last page.

*Where's the  
Trouble?*



## **SCAM®** SEQUENTIAL ANNUNCIATORS *Will Tell You!*

Scam sequential annunciator systems provide an audible and flashing visual signal on the first alarm to enable the operator of your control board to determine which point in the monitored process first becomes abnormal . . . successive alarms that develop from the original abnormal condition are indicated by a steady visual signal. You can take proper corrective measures immediately because you know where the trouble started.

Shown here is a typical standardized Scam DE-LINE cabinet with integral flasher and reset pushbutton, featuring all the Scam advantages including simple, compact plug-in design.

If you've a process or system that needs automatic, fail-safe, low cost monitoring write us for literature or call the nearest representative in the cities listed below.

## **THE SCAM INSTRUMENT CORP.**

Chicago 13, Illinois  
Phone GRaceland 7-7850  
SALES REPRESENTATIVES

Atlanta • Boston • Buffalo • Chicago  
Cincinnati • Cleveland • Dallas • Denver  
Detroit • Houston • Indianapolis • Kansas City  
Los Angeles • Louisville • Minneapolis  
New Haven • New York • Philadelphia  
Phoenix • Pittsburgh • Portland • St. Louis  
San Francisco • Seattle • Tulsa • Toronto  
and Vancouver, Canada

Check 1970 opposite last page.

CHEMICAL PROCESSING

Check 1968 opposite last page.

Eardrums can sometimes double as pressure gages... BUT



**Use SR-4® Fluid Pressure Cells  
to measure and control all industrial pressures . . .  
safe, rugged, accurate to  $\pm 1/4\%$**

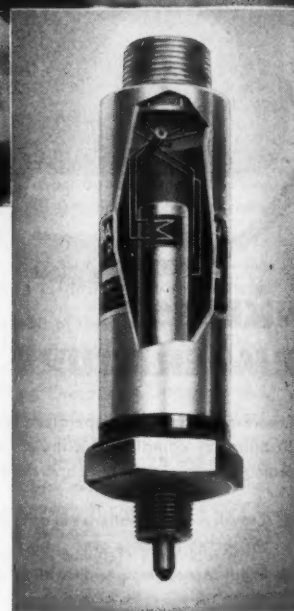
The skin diver's eardrums are a kind of "go no-go" gage that tells him when he's down as far as he can go. But popping eardrums aren't recommended for performing accurate industrial pressure measurements!

SR-4 Fluid Pressure Cells will measure absolute or differential pressures consistently to less than  $\pm 1/4\%$  accuracy! Using well-known SR-4 Bonded Wire Strain Gages, these transducers convert pressure changes directly into a varying electrical signal. This signal can be fed to Baldwin indicators,

recorders, controllers or other instruments in a system. There are no moving parts to wear out, no long pressure lines with possible leakage and fire hazards. Remember, a system is only as accurate as its transducer.

If you have pressure measurement problems, a B-L-H representative will be happy to help you—in selecting the proper transducer or in engineering a complete pressure measuring system.

Write today to Dept. A for your free copy of Bulletin 4306, showing the wide range of SR-4 Fluid Pressure Cells.



SR-4 Fluid Pressure Cells are made in standard units with capacities as low as 15 psi and as high as 50,000. With pressure converted to proportional electrical voltage, the instruments for reading changes may be located at any remote point.

For more information on product at right, specify 1971 see information request blank opposite last page.



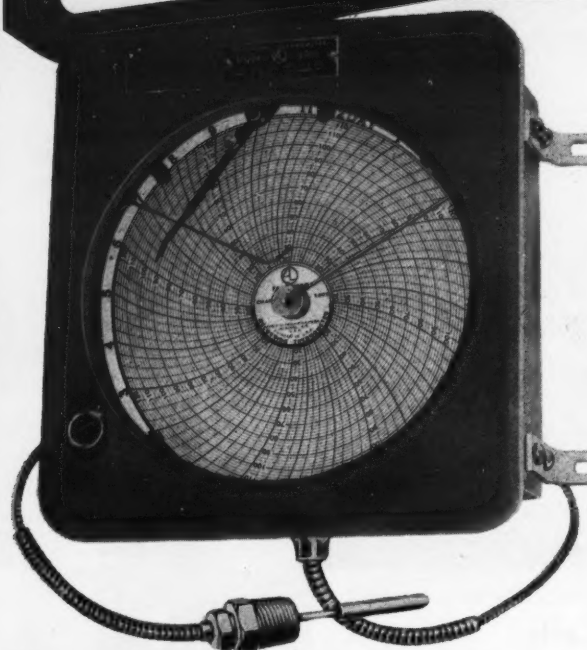
**BALDWIN · LIMA · HAMILTON**  
Electronics & Instrumentation Division  
Waltham, Mass.

SR-4® strain gages • Transducers • Testing machines



**NEW**

# AUTO-LITE



## INKLESS TEMPERATURE RECORDER!

The newest advance in temperature recording . . . Auto-Lite model 2200 operates completely without ink. It simplifies temperature recording for most processing operations.

- 2 small mercury batteries in case energize transistor oscillator connected to stylus arm.
- Stylus records temperature on 6" evenly calibrated sensitized chart.
- Battery life approximates 2000 hours.
- Records operating temperatures for 24-hour or 7-day cycles.
- Easily serviced—minimum maintenance.

Electric or mechanical chart drive available for either 24-hr. or 7-day rotation. In wall mounting, portable and self-contained type cases. Remote reading with capillary tubing. Temperature charts in ranges from -40°F to +550°F. Write for further information.



THE ELECTRIC AUTO-LITE COMPANY  
INDUSTRIAL THERMOMETER DIVISION  
TOLEDO 1, OHIO  
NEW YORK • CHICAGO • SARNIA, ONTARIO

Check 1972 opposite last page.

## INSTRUMENTATION

### High-pressure switch has stainless steel component

Suitable for use with corrosives

**Uses:** Limiting or controlling pressure of air, oil, gases.  
**Features:** Has stainless steel bourdon tube switching element for use in corrosive mediums.

**Description:** High-pressure industrial switch has an operating range of 100 to 1000 psi. Instrument is available in



High-pressure switch is designed for use in corrosive mediums

three models. One completes an electrical circuit on a drop-in pressure. Another does this on a rise in pressure. Third incorporates a single-pole, double-throw electric switching. All switches permit viewing of mercury switch position. Control point can be adjusted.

(High-pressure industrial switches are product of Minneapolis-Honeywell Regulator Company, Dept. CP, Wayne & Windrim Aves., Philadelphia, Pennsylvania.)

Check 1973 opposite last page.

### Describes testing services

Twelve pages show diversified testing services offered to manufacturers of military and commercial equipment. "Testing Services"—Aerotest Laboratories, Inc., 129-11 18th Ave., College Pt. 56, N.Y.

Check 1974 opposite last page.

## MARSH Mastergauge



The gauge that has everything!

- **LEAK-PROOF ONE-PIECE CONSTRUCTION** . . . bourdon tube fused to socket and tip by exclusive "Conoweld" process.
- **STURDY "MARSHALLOY" CASE** . . . formed of boiler-plate-thickness steel, copper clad inside and outside to give it the corrosion resistance of solid copper. It's one third lighter, but four times stronger than cast iron.
- **PRECISION "MASTERGAUGE" MOVEMENT** . . . with such exclusive features as the coined sector gear.
- **AVAILABLE WITH STAINLESS TUBE AND SOCKET** . . . choice of stainless steels and alloys for all corrosive conditions.
- **WITH "RECALIBRATOR"** . . . quickest and best way to keep a gauge accurate.

These features are combined only in "Mastergauge", standard bearer for the broad line of Marsh Gauges . . . each the best of its kind. Ask for data.

**MARSH** "THE STANDARD OF ACCURACY"

MARSH INSTRUMENT CO., Sales Affiliate of Jas. P. Marsh Corp., Dept. Z, Skokie, Ill.  
Marsh Instrument and Valve Co. (Canada) Ltd. 8407 103rd St., Edmonton, Alberta.  
Houston Branch Plant: 1121 Rothwell St., Sect. 15, Houston, Texas.

Check 1975 opposite last page.

*Lumenite*

## AUTOMATIC CONTROLS

ELECTRONIC LIQUID LEVEL  
INDUSTRIAL TIMERS  
TIME SWITCHES  
MAGNETIC SWITCHES

Ask for Bulletin

FL—Liquid Level  
FM—Milk Level  
FN—Nonconductive Liquid  
ITC—Ice Thickness  
BH—Boiler Level

Ask for Bulletin

LT—Time Switches  
PC—Program Clocks  
CR—Cycle Repeater  
R—Time Delay Relay  
RMC—Automatic Reset

*Lumenite Electronic Company*

ENGINEERS • DESIGNERS • MANUFACTURERS  
407 S. Dearborn Street Chicago 5, Ill.

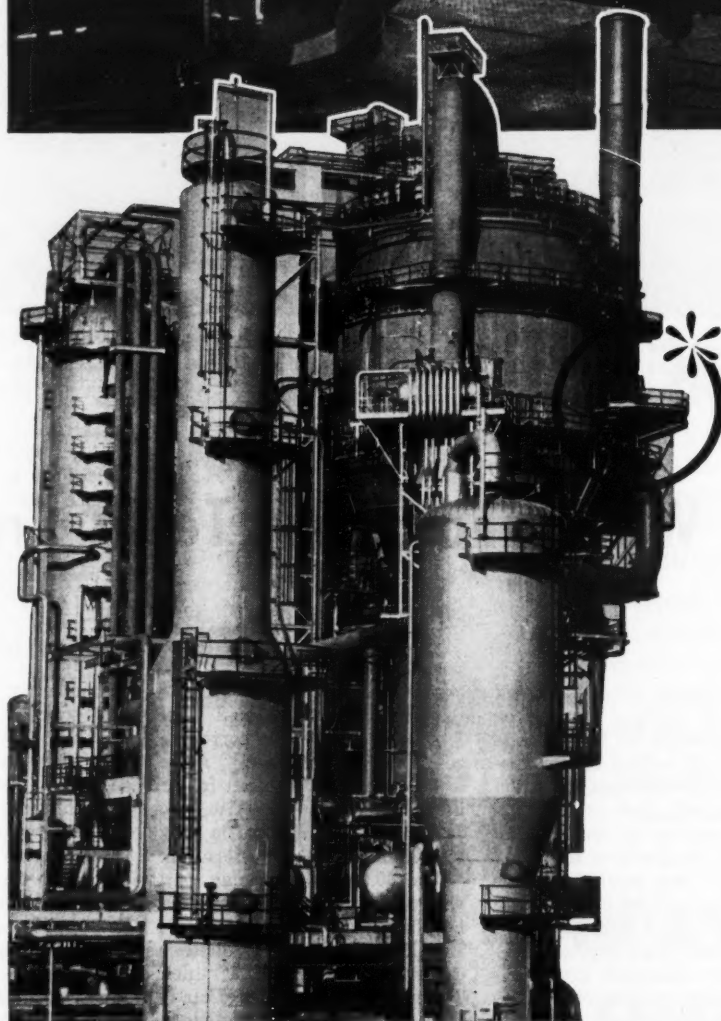
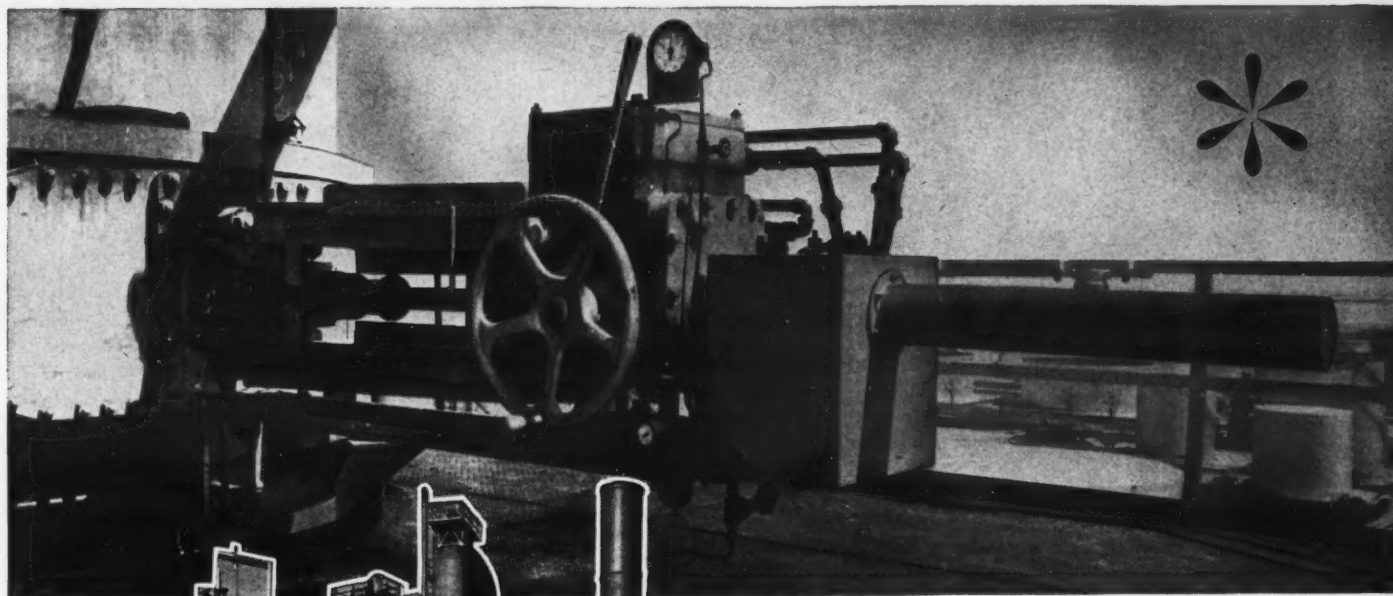
Check 1976 opposite last page.

CHEMICAL PROCESSING



# CONOFLOW ROTOMOTORS®

## CONTROL STACK VALVES IN WORLD'S MOST MODERN REFINERY



Throughout the world, hundreds of Conoflow Rotomotors are in constant use actuating large stack valves and slide valves. Rotomotors have proved to be the safest, most powerful, and most dependable actuators available for these critical throttling control services.

Seventeen Rotomotors were specified and installed by contractors in Tidewater's new Delaware Refinery—the world's largest integrated refinery.

Photographs show one of a pair of these unique pneumatic actuators operating a 72-inch double disc regenerator vent valve on a large diameter stack, 200 feet above ground on M. W. Kellogg Company's Orthoflow unit. The two Rotomotors actuate opposed sliding valve discs, each covering one-half of the rectangular port opening, 38 inches by 50 inches. Discs travel 25 inches from fully closed to fully opened position.

Required positioning accuracy of one part in 400 of stem travel is obtained despite heavy stem load of 18,000 lbs. Assembly is completely air operated, hence explosion-proof.

### How the Rotomotor Works . . .

is described with schematic diagrams in Conoflow Technical Bulletin 107-2, available on request. Send for your copy today—it will be mailed promptly.

Conoflow engineers, highly experienced in the application of the Rotomotor, will be pleased to assist you in determining its suitability for your requirements. Write today to Conoflow Corporation, 2100 Arch Street, Philadelphia 3, Pa. Representatives in principal cities.

*Cono Controls®*

**CONOFLOW CORPORATION**  
FOREMOST IN FINAL CONTROL ELEMENTS



For more information on product at right, specify 1977 see information request blank opposite last page.

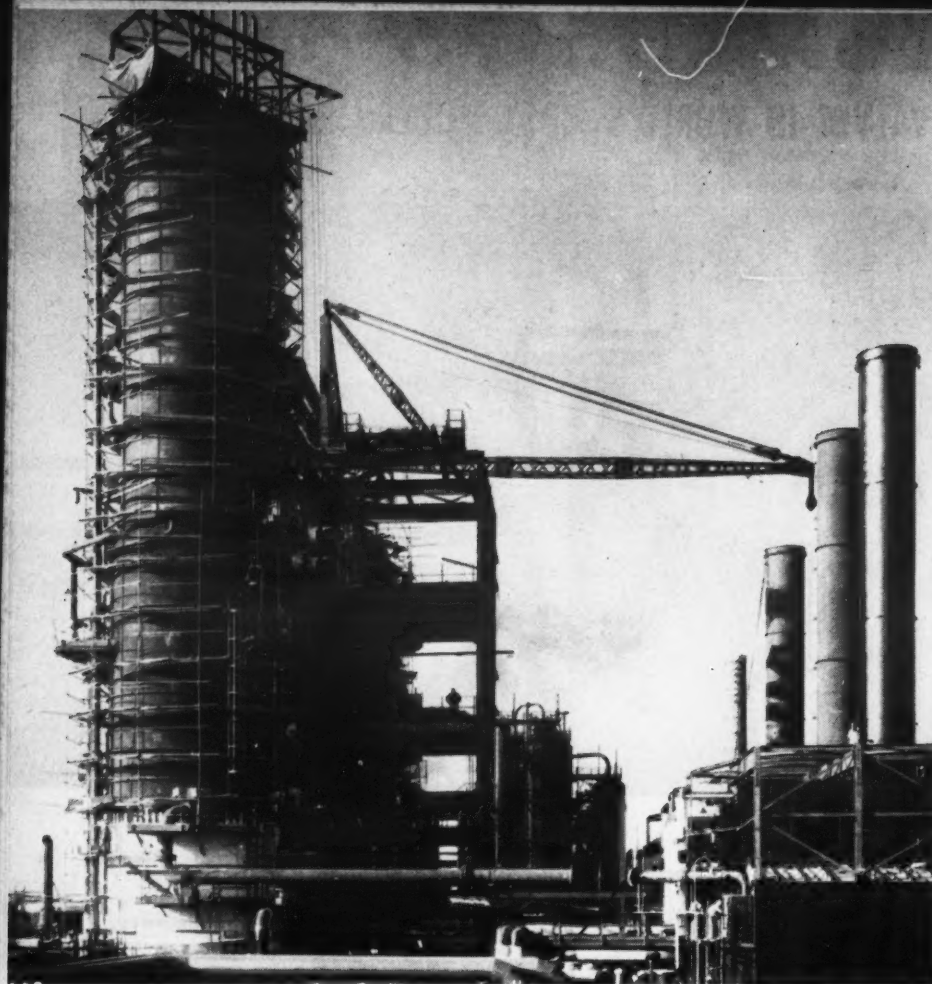
Ask for Bulletin

Switches  
Ram Clocks  
Repeaters  
Delay Relay  
Automatic Reset

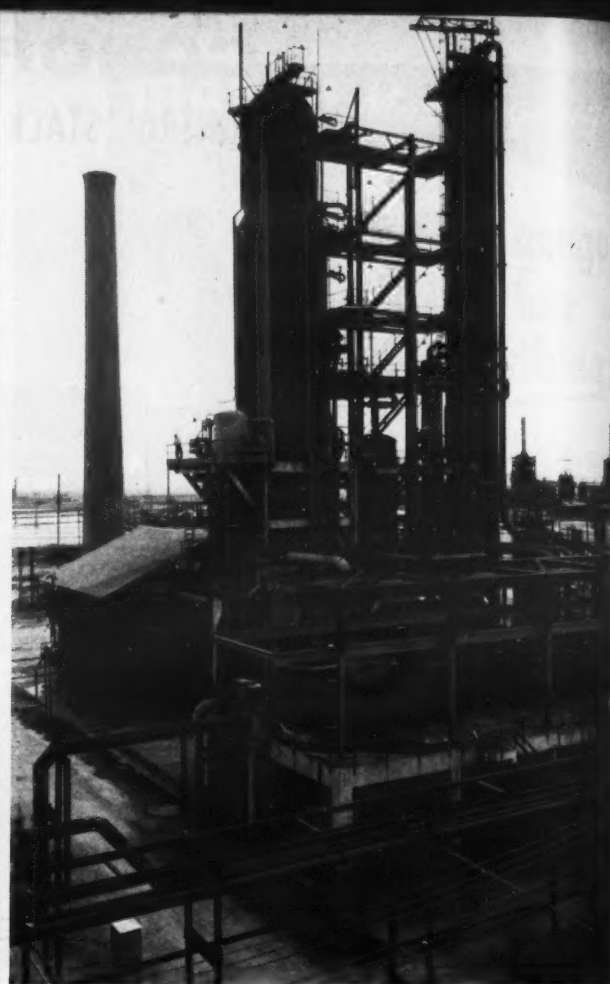
pany

. III

SSING



New crude distillation unit, shown under construction, uses stainless clad in both towers to enable it to handle West Texas crude without corrosion



Stainless clad shell of still hasn't been hurt by eight years service handling corrosive crude with high sulfur content

**Favorable experience during eight years service on one distillation unit caused refinery to use same type shell on new 100,000 bbl-per-day crude unit — because company found that economical, easy-to-install stainless clad steel —**

**GORDON WEYERMULLER**  
Associate Editor

## Withstands West Texas Crude

West Texas crude — well known to refinery men as a tough material to handle due to its high sulfur content — has been satisfactorily resisted by stainless clad steel at a major refinery in the Southwest. No evidence of any corrosion of clad steel shell was found when 30,000 bbl-per-day distillation unit was inspected after seven years service handling the corrosive crude.

This excellent performance was a major factor in refinery's decision to use the same type clad steel shell for the new 100,000 bbl-per-day crude unit

which went on stream recently. Economy of the clad steel — which provides the corrosion resistance of stainless at a lower cost — was another factor in refinery's choice. Also, the fact that the clad steel is easy to install was a consideration.

The 30,000 bbl-per-day unit was placed in service September 8, 1948. Vacuum tower is 18' ID and 109' high. Shell is constructed of 5/64"-thick Type 405 Stainless Steel cladding on 5/8"-thick carbon steel. Stainless clad steel is a single bimetallic plate, the stainless surface being integrally and

permanently bonded to lower cost carbon or alloy steel backing plate. Everything except the top 17' condensing section is clad steel. Top section is gunned.

Temperatures in this tower range from 720°F in bottom to 325°F at top of fractionating column. Temperature is 120°F at top of condensing section. Vapors contain H<sub>2</sub>S. Hydrocarbons and steam condense in top section. This stainless clad shell was inspected on October 5, 1955, after seven years — 58,770 hours — handling the West Texas crude. No evi-

CP C

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dence of any damage to shell was found. On April 1, 1956, unit started handling a less corrosive crude.

New 100,000 bbl-per-day unit, which went on stream about a year ago, was designed to handle 100% West Texas crude although a portion of other types of crude are being processed in it now. In this unit all of the charge goes to the atmospheric tower, part of this passing to larger diameter vacuum tower. Both vacuum tower and atmospheric tower use stainless clad.

Vacuum tower is 30' in diameter and 75' high. Main fractionating section has shell constructed of 5/64"-thick Type 405 Stainless clad on 3/4"-thick carbon steel. First 4' 10" of condensing section, above main fractionating column, is constructed of 5/64"-thick Type 316 Stainless clad on 3/4" carbon steel. Above this, plain carbon steel is used.

Atmospheric tower of new unit is 115' high, the lower half being 24' in diameter and the upper half 21' ID. The 5/64"-thick Type 405 Stainless clad is used on the first 96' of lower half and first 71' of upper half of the atmospheric tower.

Atmospheric tower varies in temperature from 650° in bottom to 225°F in top. Temperature of vacuum tower varies from 725° in bottom to 325°F in top. Crude unit is expected to give many years of satisfactory service before repairs to shell are needed.

(Stainless clad steel is product of Lukens Steel Co., 1949 Gillen St., Coatesville, Pa.)

Check 1978 opposite last page.

#### Urethane coatings

Bulletin of six pages on manufacturer's urethane coatings covers applications, curing, storage and handling precautions, and suggested uses. Bul KP-2—The Kansas Paint & Color Co., 132 N. Mosley, Wichita 2, Kan.

Check 1979 opposite last page.



## This Ell Bolt is the Key to leak control

The patented Ell Bolt construction employed on Vogt floating head heat exchangers is the answer to re-assembly without distortion or leak development.

Cover may be removed by simply loosening the Ell Bolt nuts and disengaging the Ell Bolt heads from the "lock notches." No misplacing of Ell Bolts can result — and tightening is easy and positive — absolutely leak proof. Send for Bulletin HE-6. Address Dept. 24A-XCP.



#### OTHER VOGT PRODUCTS

Drop Forged Steel Valves,  
Fittings and Flanges in a  
complete range of sizes •  
Petroleum Refinery and Chemical  
Plant Equipment • Steam Generators •  
Heat Exchangers • Ice Making  
and Refrigerating Equipment.

## HEAT TRANSFER EQUIPMENT

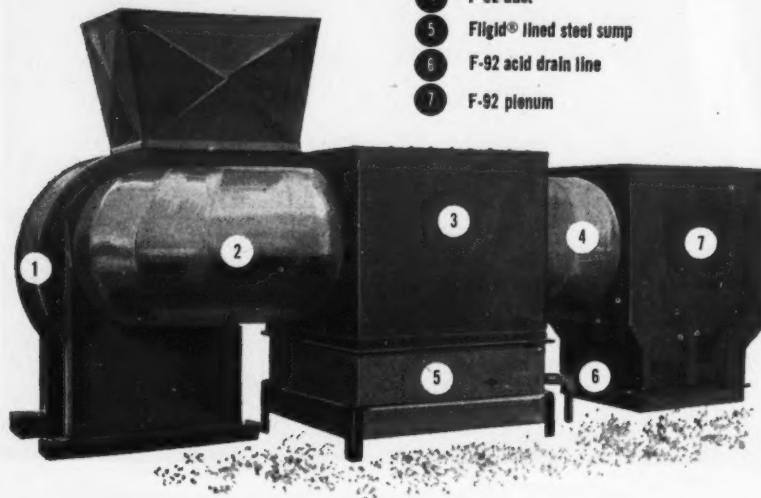
Check 1980 opposite last page.



## new pvc scrubber recovers 98% of chromic acid eliminates corrosion

Because it is made of an outstanding structural material—VYFLEX F-92 Unplasticized P.V.C., this scrubber offers substantial advantages in design, operation, maintenance over conventional types. It is constructed throughout of Vyflex F-92—even to the bolts and nuts, as well as the scrubber packing, except for a metal sump, which is lined with Vyflex FLIGID Lining.

Installed at Hohman Plating Co.,  
Dayton, Ohio  
Fabricated by S & C Manufacturing Co.,  
Cincinnati, Ohio



- 1 existing steel fan
- 2 existing steel duct
- 3 F-92 scrubber with F-92 packing
- 4 F-92 duct
- 5 Fligid® lined steel sump
- 6 F-92 acid drain line
- 7 F-92 plenum

- **Design:** The particular 10,000 cfm capacity scrubber shown is extremely compact... weighs only 600 lbs... an 83% weight reduction. It is easily mounted wherever convenient... in one piece... on roofs or hung from ceilings without special supports.
- **Operation:** Careful design and full use of the many advantageous properties of Vyflex F-92 Unplasticized P.V.C. contribute to the extremely high efficiency. Unit shown above scrubs chromic acid fumes at a rate of 10,000 cfm with only 10 gallons of water per minute and effects a 98% recovery of expensive chromic acid. This complete scrubbing eliminates corrosion of fans and overcomes many of the problems of air-pollution with corrosive or offensive fumes.
- **Maintenance:** Since fumes are only in contact with VYFLEX F-92, scrubber corrosion becomes a thing of the past. And the hard, polished surface of Vyflex F-92 has greatly reduced liming—formerly a difficult maintenance problem.

VYFLEX F-92 Unplasticized P.V.C. was a logical choice as material of construction for these scrubbers, since its wide corrosion resistance range permits the use of this equipment in a broad line of chemical processing operations.

Other standard and custom designed equipment and parts of VYFLEX F-92 Unplasticized P.V.C. to solve your corrosion problems, are available from well equipped and highly experienced Kaykor fabricators across the country.

**GET THE FACTS!** Write for complete information in new Bulletin "F-92". Available free on request to Kaykor Industries, Inc., 4401 Broad Street, Yardville, New Jersey, or ask your local Kaykor fabricator.

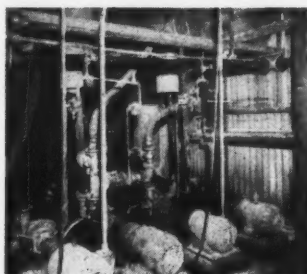
**K<sup>®</sup> KAYKOR INDUSTRIES INC.**  
Division of Kaye-Tex Manufacturing Corp.  
YARDVILLE, NEW JERSEY

Check 1981 opposite last page.

## CORROSION CONTROL

**75% phosphoric piped  
at 260°F for over year  
without failing**

Carrying phosphoric acid at 260°F, epoxy-resin reinforced pipe has operated for 16 months without any loss in strength or failure occurring. A chemical plant in the Midwest tried other types of piping in this same application with little success. Former pipe lasted only from three to six months.



Epoxy-resin reinforced pipe carries 75% phosphoric acid at 260°F

Epoxy-resin reinforced pipe is centrifugally cast and has multiple layers of seamless braided glass fiber sleeving. Its cost is approximately 1/3 that of previous piping tried. However, it has been operating successfully five times as long.

(Fibercast pipe is product of The Fibercast Corp., PO Box 727, Sand Springs, Okla.)

Check 1982 opposite last page.



"Step outside and repeat that!"



## HEAVY DUTY ACID-PROOF FLOORS

FERROLITE is a very hard, yet resilient, acid and waterproof, jointless type of floor finish. FERROLITE can be installed over any type of solid base such as wood, concrete or brick and will withstand concentrated floor loads of over 600 lbs. per square inch without indentation. FERROLITE COLORS are Red, Brown, Gray and Black.

### ADVANTAGES —

FERROLITE Finishes are jointless, very homogeneous, easily kept clean, harden like stone and can be put into service 4 hours after installation. FERROLITE is elastic, resilient under foot, AND — it's ACID-PROOF. Also oil and grease proof FERROLITE is available.

### APPLICATIONS —

Both the acid-proof and standard FERROLITE Floor Finishes are especially suited for chemical plants, plating rooms, acid processing plants, food plants, paint and varnish plants, in fact wherever chemicals or acids or a combination of both create a flooring problem.

### INSTALLATION —

FERROLITE is installed in varying thicknesses of 1" up from thermo-regulated mobile power units especially designed in Europe and now available through Fulton in this country. All Fulton installations are made with our trained floor crews under our supervision which guarantees both quality of workmanship and uniformity of the finished product.



Write, wire or phone today to

**FULTON  
ASPHALT COMPANY**  
Specialists since 1870 in quality floors  
165 W. WACKER DR., CHICAGO 1, ILL.  
PHONE: RA ndolph 6-1760

Check 1983 opposite last page.  
CHEMICAL PROCESSING

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Steam line

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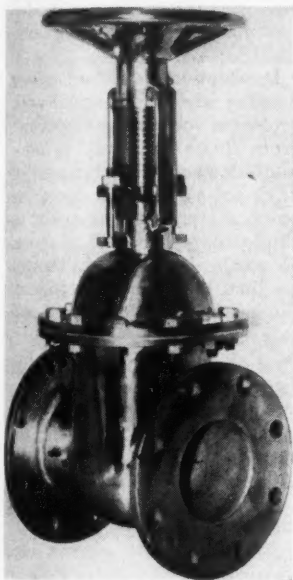
NOVEM

## CORROSION CONTROL

**Titanium fabricated valve  
would resist salt water  
for 1000 years**

More than two and one-half years in making, six-inch wedge-gate valve of titanium is estimated by manufacturer to have no noticeable corrosion after 1000 years in salt-water service. Valve is 24" high and weighs about 60 lb.

Toughness, light weight, and corrosion-resistant qualities will permit valve to reduce maintenance costs drastically.



(Titanium valve was developed by Fabri-Valve Company of America, Dept. CP, Portland, Oregon.)

Check 1984 opposite last page.

### Steam line corrosion

Treatment for rust and corrosion in steam lines, return lines, radiators and steam heated processing equipment is discussed in 2-page bulletin. Causes of corrosion and action of water treatment are explained. Bul M-A—The North American Mogul Products Company, Department CP, Standard Building, Cleveland 13, Ohio.

Check 1985 opposite last page.



**Glascote's acid-alkali glass**

— 100% corrosion resistant  
with zero contamination

**Glascote's non-stick glass**

can't clog . . .  
polymers flow free

**double-barreled protection  
for highly corrosive processing and polymer production**

## Glascote glass-lined pipe and fittings

GLASCOTE has now improved delivery of glass-lined pipe and fittings almost 50%. In fact, GLASCOTE now manufactures and stocks pipe and fittings to ASME standards for fast delivery to help you with your replacement problems in scores of applications.

Pipe is fabricated and stocked in standard

lengths up to 10 ft. and inside diameters from 1½" to 4". Larger diameters are made to order.

Standard fittings in 1½" to 4" diameters are stocked. Larger sizes and special pieces are built to order.

Leak-proof gaskets, available to suit materials conveyed, can be installed without special tools.

Our standard one-year guarantee continues to apply to all Glascote glass-lined products.

**Glascote**  
PRODUCTS, INC.

CLEVELAND 17, OHIO

Sales Offices or agents located in

New York • Philadelphia • Union, N. J. • Chicago • Cleveland  
Dayton • Houston • Los Angeles

Export Sales: A. O. Smith Corp., International Division, Milwaukee 1, Wis.



Ask the representative who calls on you for all the facts about Glascote products — reactors, receivers, condensers, evaporators, storage tanks and accessory products. Or, if you prefer, write direct. Glascote Products, Inc., Cleveland 17, a subsidiary of A. O. Smith Corporation.

**A subsidiary of A.O. Smith Corporation**

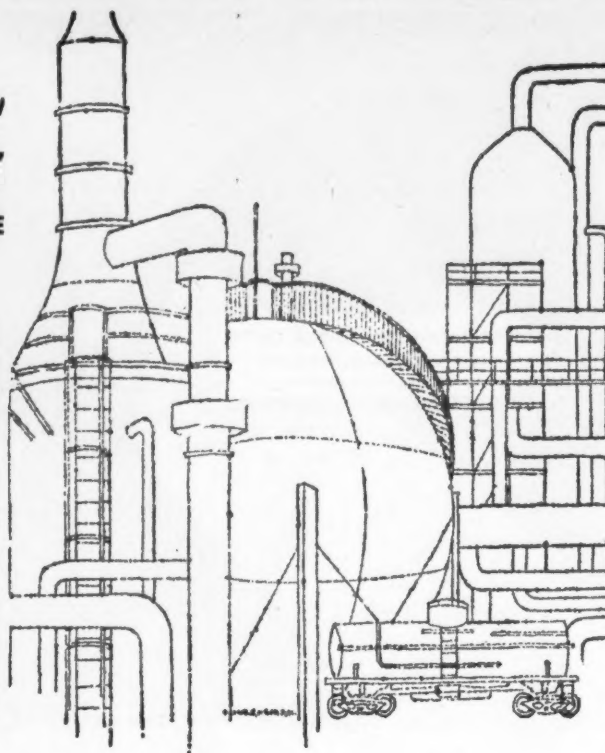
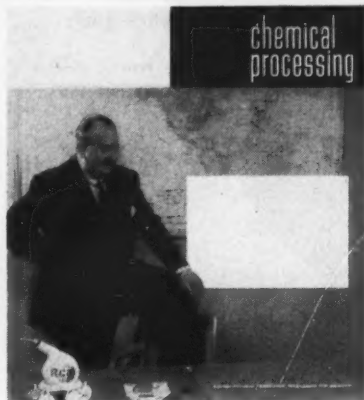
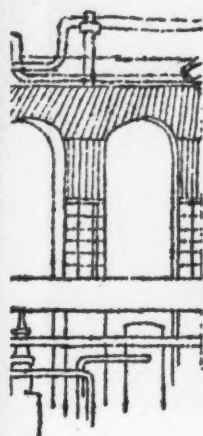
World's largest manufacturer of glass-lined steel products



Check 1986 opposite last page.



INTRODUCING THIS NEW  
"EXECUTIVE SIZE"  
OF CHEMICAL PROCESSING MAGAZINE



This issue of **CHEMICAL PROCESSING** is *different*. Lay this copy alongside an earlier issue (before July) of CP... compare them. Hold the new issue in your hands... slip it into your brief case. It "fits"... it invites easy reading... for busiest-of-all chemical executives.

**IT NAMED ITSELF  
"THE EXECUTIVE SIZE"...**

for the new format has been styled for today's busy executives... expanded main editorial sections covering subjects vital to the management team in chemical processing industries... prepared in the established Putman editorial style.

**AN EARLIER ORIGINAL  
DESIGN IMPROVES...**

Nineteen years ago Putman Publishing Company created the original design for business magazines, known as "King Size"... bringing heretofore

unknown visibility and greater effectiveness in editorial presentation (yes, for advertising, too). Scores of other magazines adopted this format, and use it today.

Now, the "Executive Size" brings you new advantages... while retaining the best of the old.

Turn to pages 48 and 49. Look at the unusually effective presentation of the editorial matter... the "cinemascope" wide-screen layout.

Leaf anywhere through the magazine... editorial material *everywhere*... front and back. No solid sections of advertising pages... newspaper-width editorial columns invite easy reading throughout.

We think you'll find the new "Executive Size" of **CHEMICAL PROCESSING** easier to read, more interesting. Don't you agree? We'll welcome your comments.

*All Putman magazines now appear in this new "Executive Size"...  
FOOD PROCESSING, FOOD  
BUSINESS, POWER INDUSTRY,  
as well as CHEMICAL PROCESSING.*

**PUTMAN PUBLISHING COMPANY**

111 E. DELAWARE PLACE • CHICAGO 11, ILLINOIS



"Executive Magazines for Industry"

**CORROSION**

**Concrete surfacing  
material maintains  
permanent bond**

Epoxy formulation has excellent corrosion resistance

**Uses:** As surfacing material, patching material, and grout. Without aggregate it can be used as a high film build, non-sagging, corrosion-resistant paint.

**Features:** Material maintains permanent bond under all conditions of operation and weather. It is resistant to non-oxidizing acids and solutions, to most solvents, and to high strengths of caustics. It is also resistant to high volume traffic.

**Description:** Modified epoxy flooring surface, designed with problems of protecting concrete floors in mind, is normally troweled to thickness of 3/32 to 1/8". When used as paint, material is sag-proof in single coats of 0.10" or more. Any color is possible, although medium light gray is standard. Surfacing is easy to apply and safe to handle.

(Poly-Chem 1100 is product of Dittbrenner Associates, Inc., Dept. CP, 18 Oneida Ave., Rockaway, N.J.)

Check 1986A opp. last page.

**Impervious graphite pump  
averages maintenance cost  
of 51 cents per month**

Self-cooling seal design eliminates special lubrication

Total expense for material and labor on 14 impervious graphite chemical pumps for a three month period was \$23. According to maintenance manager, Durez Plastics Division, Hooker Electrochemical Company, these pumps installed at the North Tonawanda Plant had an average maintenance cost of 51 cents per month. At Durez, the pumps are used to convey various corrosives ranging from commercial muriatic acid to hot mixtures of phenol, chlorobenzene, benzene, and other aggressive chemicals.

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Check 19

**Titanium**

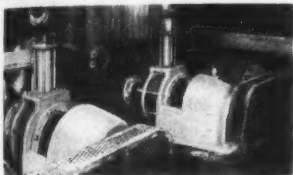
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Wooster,  
Check 19



## CORROSION

Pumps are single-stage impeller-type centrifugals. All parts of pumps which come in contact with corrosives are made of impervious graphite. This material is unaffected by the action of corrosives, except a few strong oxidizing agents, and is immune to the effects of thermal shock.

Unique, self-cooling seal design was one of major reasons for selection of these pumps.



Unique, self-cooling seal design on impervious graphite pumps eliminates special lubrication

Seal is composed of rotary and stationary carbon ring, which is capable of withstanding temperatures in the 500°F range. The ability of this seal to accommodate these high temperatures without failure, combined with unique design which permits cooling of seal without corrosive handled in pump, provides simplified sealing method. This eliminates necessity of special lubrication, or externally located cooling apparatus.

Impervious graphite centrifugal pumps are available in six standard models in capacities ranging from 25 gpm at head pressure of 20 psi to 200 gpm at 100 psi head. Larger capacity pumps, to 1000 gpm, are also available.

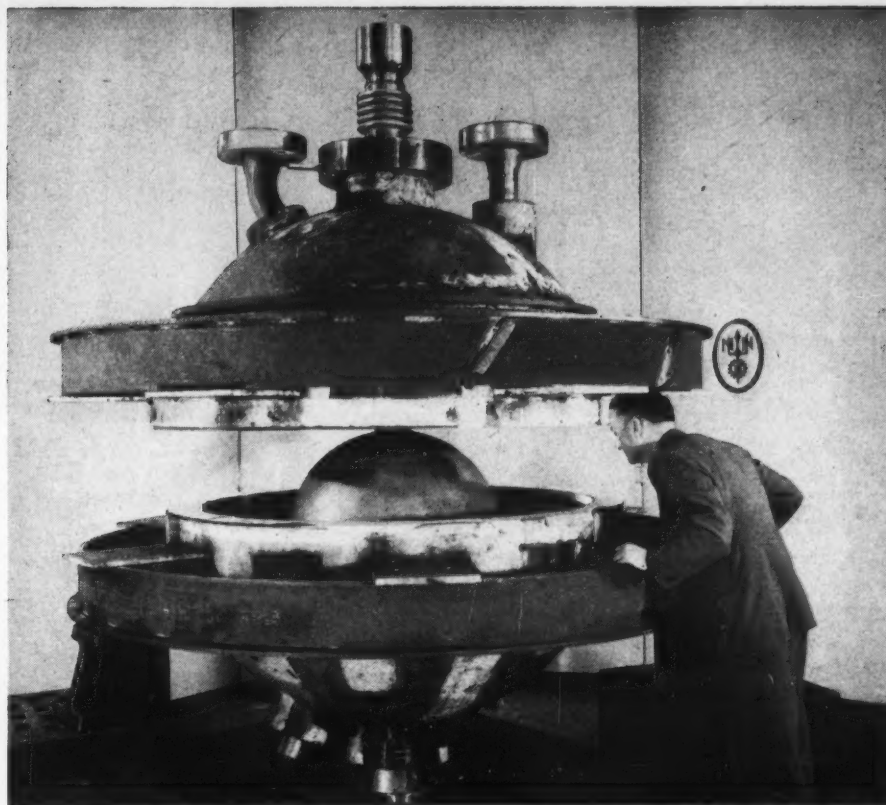
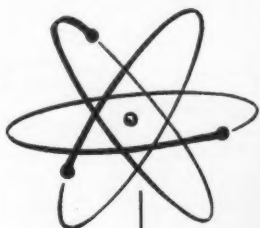
(Impervite impervious graphite pumps are product of Falls Industries, Inc., Aurora Rd., Solon, Ohio.)

Check 1987 opposite last page.

### Titanium in anodizing

Superior corrosion resistance of titanium in anodizing operations is discussed in four-page bulletin. Anodizing Bul — Johnston & Funk Titanium Corp., W. Kemrow Ave., Wooster, Ohio.

Check 1987A opp. last page.



Assembly of zircaloy-2 core tank and pressure vessel for Homogeneous Reactor Experiment No. 2 (HRE-2). The HRE-2 is a 5,000 KW plant designed for AEC by Union Carbide Nuclear Company. Newport News manufactured the 32" I.D. core vessel from 5/16" zircaloy-2, which involved

the development of new welding techniques. The pressure vessel of Type 347 stainless clad steel is 4.4" thick, with an inner diameter of 60". Newport News designed the expansion joint between inner and outer vessels, and also produced the unusual coil-cooled blast shield for the unit.

## Zircaloy-2 vessel produced by Newport News...for first two-region breeding homogeneous reactor

Never before had a pressure vessel been constructed from zircaloy-2.

Extremely active chemically, particularly at elevated temperatures, this alloy challenged fabrication. Unshielded, heated zircaloy absorbs atmospheric gases in quantities that render its corrosion and physical properties unsatisfactory. Newport News, however, achieved consistent, satisfactory welds by use of inert gas and novel, plant-developed shielding.

The core tank contains the fuel region where fissioning produces heat. The blanket or reflector region around the tank is confined by a

pressure vessel of stainless clad steel.

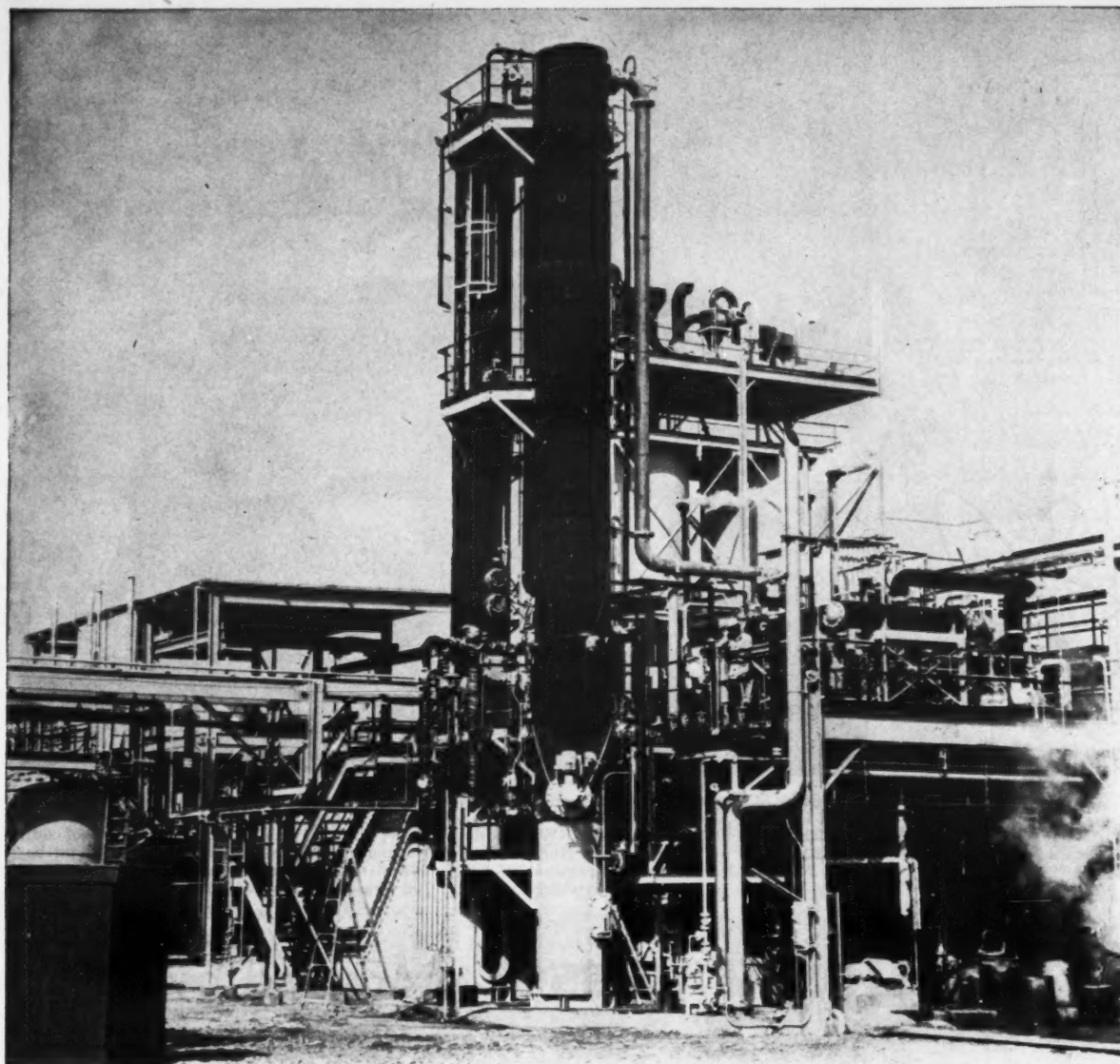
Newport News, working with its suppliers, developed special fabrication and welding techniques, as well as forge and rolling methods to produce plates and forgings with required corrosion, nuclear and physical properties for both vessels.

Make Newport News your source for fabricated metal structures. See how this company's high integration of skill and facilities can help you. Our illustrated booklet, "Facilities and Products", is yours for the asking. Write for your copy now.

## Newport News Shipbuilding and Dry Dock Company

Newport News, Virginia

Check 1987B opposite last page.



## Product spoilage eliminated in phenol plant by *Carpenter* Stainless Tubing!

Oxide discoloration was imparted to the phenol by carbon steel tubes first used in this phenol plant. A change to Carpenter Stainless Tubing has ended this problem permanently. Compare Carpenter quality, and you'll install Carpenter Stainless Tubing for your own processing applications.

MEMBER



The Carpenter Steel Company,  
Alloy Tube Division, Union, N. J.

Export Dept.: The Carpenter Steel Co., Port Washington, N.Y.—"CARSTEELCO"

# Carpenter



## Stainless Tubing & Pipe

Check 1988 opposite last page.

## CORROSION CONTROL

### **Air-injection process stops hydrogen blistering**

Patented process to prevent hydrogen blistering of steel refinery equipment has been made available to industry through a royalty-free license. The process inhibits penetration of hydrogen into steel and thus prevents blistering. Small amounts of air are injected into processing equipment, where conditions are conducive to hydrogen attack. Ammonia is added to maintain proper alkalinity.

Hydrogen damage to steel refinery equipment, particularly in units processing catalytic cracking plant gases, has been a serious and costly problem. However, application of air injection process has substantially eliminated damage. The process was developed, after four years of research, by T. Skei, and W. A. Bonner, Shell Oil Company engineers.

(Availability of U.S. Patent No. 2,780,583 has been announced by Shell Development Company, 50 West 50th St., New York 20, N.Y.)

### **FOR MORE INFORMATION**

Here's what to do when you want additional details about products and services mentioned in this issue's editorial articles or advertisements.

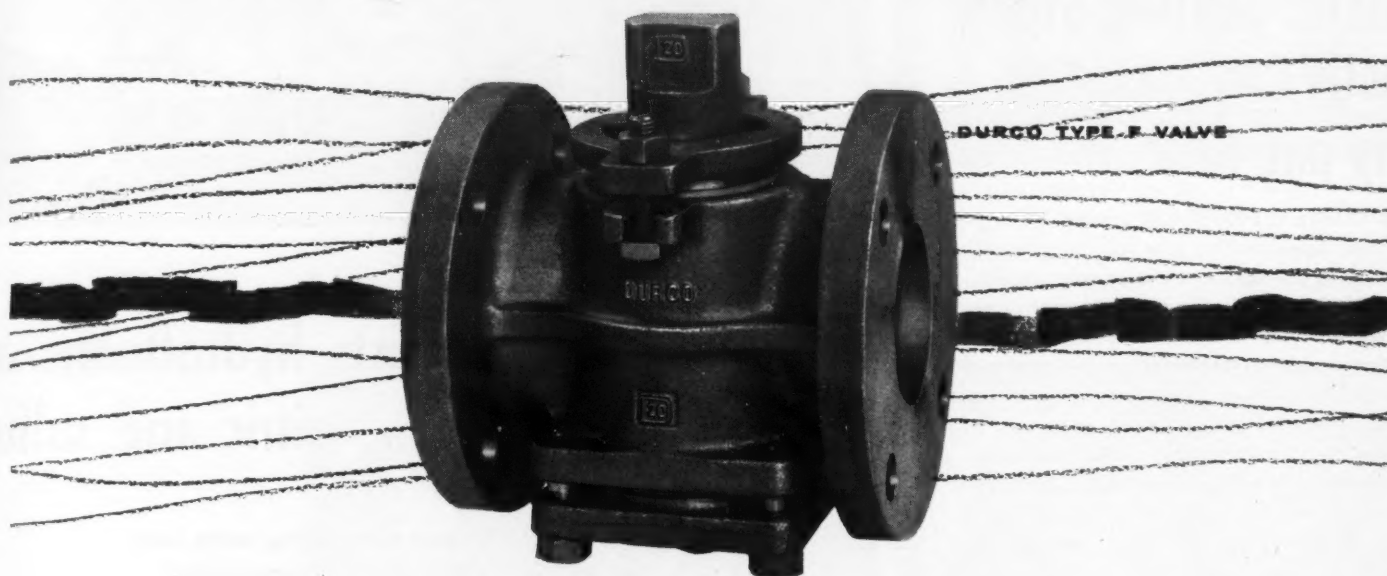
Note the number at end of article or advertisement. Check this key number on Reader Service Slip opposite last page of this issue. Fill in Slip with the other pertinent information (name, title, company, address, product made). Mail to our Reader Service Department.

We'll contact the manufacturer for you. He'll send you the details direct.

For more information on product at right, specify 1989 . . . see information request blank opposite last page.

# SAVINGS

on maintenance run to thousands of dollars at  
*Michigan Chemical Corporation • Saint Louis, Michigan*



Previous valves on a chlorinator manifold at Michigan Chemical Corporation leaked so badly they required daily re-packing. The leaky valves were replaced in 1952 by Durco Type F valves. These original Type F valves are still in service and they have "resulted in saving thousands of dollars by reducing operating down time and maintenance labor."

Michigan Chemical Corporation is a basic manufacturer of industrial, agricultural, and pharmaceutical chemicals, and is a leading producer of

insecticides, bromine, bromides (organic and inorganic) magnesia, salt, and rare earth oxides, compounds, and metals. The installation described here is just one of several Durco valve installations at its Saint Louis, Michigan, plant.

Durco chemical service valves, pumps, and other engineered equipment can probably save money for you.

For answers to your tough corrosion problems, write or call The Duriron Company, Inc., Dayton, Ohio.

## DURCO TYPE F VALVES



*The mark of dependability  
in tough chemical service . . . everywhere*

**THE DURIRON COMPANY, INC. / DAYTON, OHIO**

Branch Offices: Baltimore, Boston, Buffalo, Chicago, Cleveland, Detroit, Houston, Knoxville, Los Angeles, New York, Philadelphia, Pittsburgh, and Pensacola, Fla.





## Plastic Coating Stops Costly Condensation Drip and Rust

THE COSTLY PROBLEM caused by dripping from this sweating pipe was permanently solved with one easy and inexpensive application of NoDrip Plastic Coating. Sweating pipes, ceilings, air ducts and other metal equipment are also completely protected against rust and corrosion by low cost NoDrip.

NoDrip Plastic Coating acts immediately to insulate and protect. One application adds many years of service life to metal equipment. NoDrip is also resistant to acid, alkali and brine...protects concrete, brick, plaster, tile wood or composition surfaces.

Easy application requires no special equipment or skill. Anyone can apply NoDrip with brush, trowel or spray. Stop your condensation problem now! Get full details without delay.

**JW Mortell**  
COMPANY

FREE

**32-PAGE NoDrip DATA HANDBOOK**  
Complete with photographs, charts and technical information to solve your condensation problem. Write today.

Available at leading plumbing and mill supply houses

J. W. MORTELL CO. 530 Burch St., Kankakee, Ill.

Please send my FREE copy of the NoDrip Data Handbook.

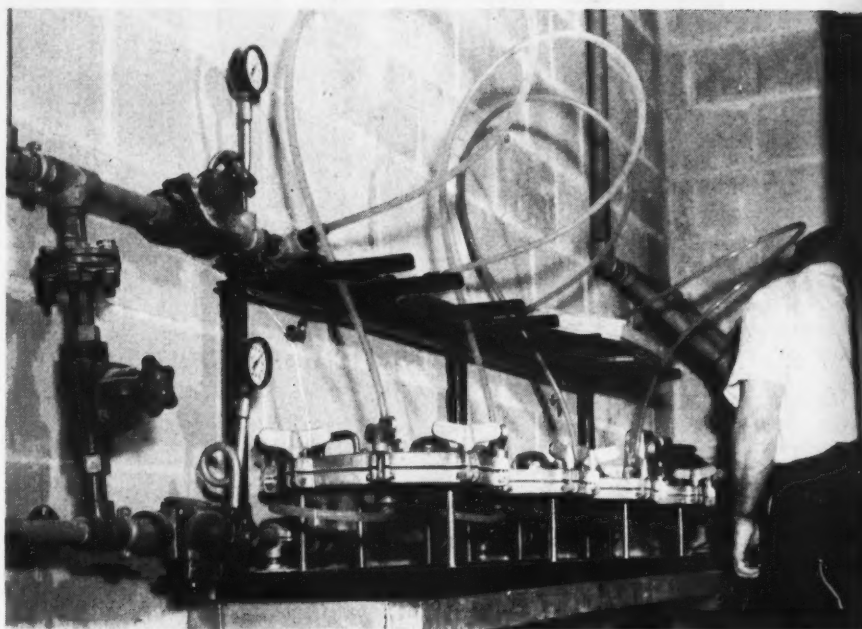
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City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

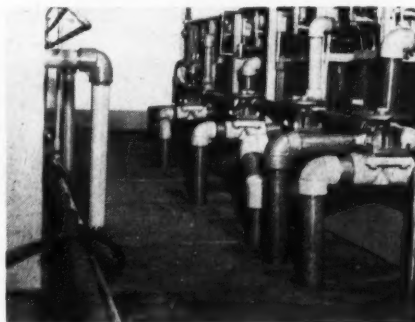
Check 1990 opposite last page.

## CORROSION CONTROL



**PVC piping system used for handling waste acids as well as corrosives used in demineralizer**

**GORDON WEYERMULLER**, Associate Editor  
With **LEWIS A. CRABB**,  
Chief Maintenance Engineer  
Machlett Laboratories, Springdale, Connecticut



**Fig. 2—Portion of PVC drainage system which conveys corrosive acids to neutralizer**

## resists hydrofluoric and hydrochloric nitric and sulfuric acids

**Problem:** Drain lines used for removing waste acids from production area of Machlett Laboratories, to an outside neutralizing sump system, had to be replaced every year. A number of different types of metallic and non-metallic piping and valves were used without success.

Plant is engaged in the manufacture of X-ray and electronic tubes. Hydrofluoric, hydrochloric, nitric, and sulfuric acids are used to treat and etch the glass used in these products. Each of the types of piping and valves used was subject to attack from at least one of these acids.

**Solution:** More than a year ago, plant installed a polyvinyl chloride drainage system. (Fig. 2) Both lines and valves are constructed of PVC. Plant also used PVC pipe and valves in conjunction with the water demineralization system (Fig. 3). Caustic soda and hydrochloric acid were used in treating the water flow

**Fig. 3—Open demineralizer**

**Fig. 1—PVC piping system used for handling waste acids as well as corrosives used in demineralizer**

through PVC system. Filters were used after demineralization. These recently can remove 0.45 micron particles. The disc also with total to 85% drop across less than 100 gpm. 1, corrosion flexible in conjunction. **Results:** valves and condition

# PVC PIPING NEWS

PUBLISHED BY TUBE TURNS PLASTICS, INC. • LOUISVILLE 11, KENTUCKY

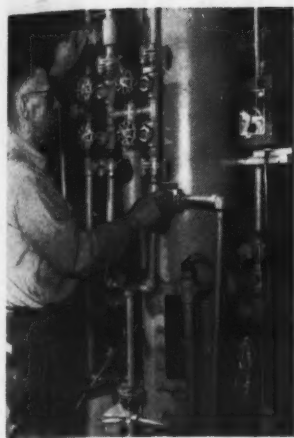
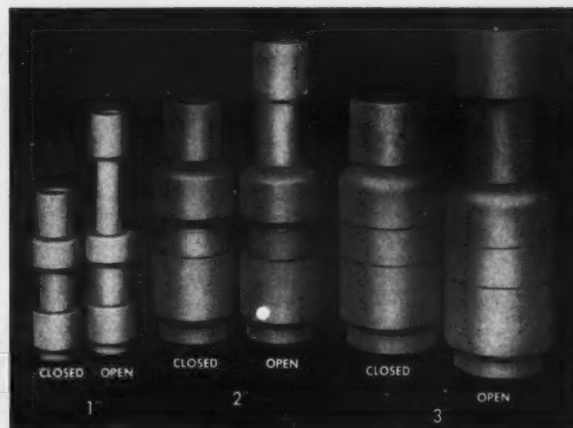


Fig. 3—Operator adjusts PVC valves on acid and caustic eductors on demineralization system at Machlett

Fig. 1—PVC valves control flow to and from filters which handle the water after demineralization. Note saran tubing



**UNPLASTICIZED!** There's a vast difference in physical and chemical properties . . . and therefore the *performance* . . . of different types of "rigid" PVC fittings. The key point to check is: Are they *unplasticized*? Cheap fittings are not. Guard your reputation by insisting on **ttp** *unplasticized* PVC fittings!



**EXPANSION JOINTS.** Another "first" in *unplasticized* polyvinyl chloride fittings by Tube Turns Plastics, Inc. For rigid PVC piping subjected to thermal cycles. Slip type. For wide range of corrosive services. Have neoprene rubber "O" ring packing. All sizes allow an expansion of  $3\frac{3}{4}$ ". Available in sizes of 1", 2" and 3" and may be used with smaller piping by using reducing bushings. Write for complete information.



**CHLORINE PLUS WATER** equals corrosion. So, you'll find many water treatment engineers swinging over to PVC piping and **ttp** fittings for chlorination systems for long-lasting, economical construction. Above: 1" PVC piping with solvent cemented **ttp** fittings recently installed at pumping station of Jackson, Michigan.



**SERVICE PLUS.** Your nearby distributor of **ttp** products carries a full line of unplasticized PVC fittings, flanges and valves, as well as PVC solvent cement and thread lubricant. Also, he can give you design and installation data on PVC piping. Above: At Galloup Supply Co., Jackson, Michigan.

Leading Manufacturer of Injection Molded Polyvinyl Chloride  
Pipe Fittings, Flanges and Valves

**TUBE TURNS PLASTICS, INC.**

Dept. P-11-A, 2929 Magazine St. • Louisville 11, Kentucky

Check 1991 opposite last page.

**This could have  
been avoided  
... with  
GLIDDEN  
PROTECTIVE  
COATINGS!**



Research and field experience plus quality materials combine to give Glidden maintenance coating systems an enviable performance record. Each of these superior coating systems is specifically engineered to provide positive protection at lowest maintenance cost per foot per year, in even the most corrosive atmosphere.

For example, NU-PON COTE\*, a catalyzed epoxy, is designed for situations involving elevated temperatures and extreme solvent conditions. It also provides maximum alkali, water and abrasion resistance in a tough film that is hard yet flexible.

Perhaps NU-PON COTE or one of our vinyl or alkyd systems holds the answer to your corrosion problem. If not, Glidden research is at your service.

\*A Glidden Trade-Mark



Write today (company letterhead, please) for your copy of this new book which contains complete information on all Glidden Industrial Maintenance Coatings.



## THE GLIDDEN COMPANY

INDUSTRIAL MAINTENANCE HEADQUARTERS  
900 Union Commerce Bldg. • Cleveland 14, Ohio

SALES OFFICES AND FACTORIES: San Francisco, Los Angeles, Chicago (Nubian Division—1835 North LaSalle Ave.), Minneapolis, St. Louis, New Orleans, Cleveland, Atlanta, Reading. In Canada: Toronto and Montreal.

Check 1992 opposite last page.

## CORROSION CONTROL

year of use. No maintenance has been needed on them in spite of the highly corrosive materials handled.

(PVC valves are product of The Walworth Co., 60 E. 42nd St., New York 17, N.Y.)

Check 1993 opposite last page.

(MF Submicron water filter is product of Barnstead Still & Demineralizer Co., Lanesville Terrace, Boston 31, Mass.)

Check 1994 opposite last page.

(Saran tubing is product of Saran Lined Pipe Co., 2415 Burdette Ave., Ferndale 20, Michigan.)

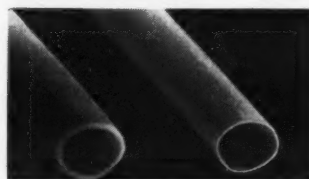
Check 1995 opposite last page.

### Thin-wall Teflon tubing has strength, properties of heavy-wall type

Uses: For applications in electronics and chemical fields.

Features: Light, flexible material retains strength and properties of heavy-wall type. It has a temperature range from -450 to +550°F, and is extremely easy to handle.

Description: Thin-wall Teflon spaghetti tube is lower in cost than many similar tubes and provides superior performance. It is highly advantageous in applications requiring sharp tube bends in



Light weight and extreme flexibility of thin-wall Teflon tube make it suitable for many electronic and chemical applications

restricted corners.

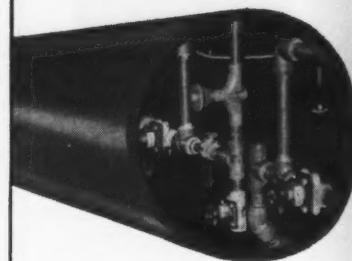
Produced in standard color coding range, tube is available in wall thicknesses from 0.005 to 0.010".

("Microthin" tube is product of W. S. Shamban & Co., 11617 W. Jefferson Blvd., Culver City, California.)

Check 1996 opposite last page.

## AT PATHECOLOR

# 10,000 FEET OF CORROSION RESISTANCE



## ALPHA PVC PIPE

10,000 Feet of Alpha PVC piping provide Pathecolor, Inc., with corrosion-proof photographic development system.

- Resists 5%  $K_2FE(CN)_6$ , + dilute  $H_2SO_4$ ; also 4%  $HBr$ .
- Won't contaminate solution.
- 1/4 cost of stainless.
- 1/2 weight of aluminum.
- Joints made with hacksaw and cement only.

If you convey corrosive or hazardous liquids, Alpha PVC can solve your piping problems too.



SEND FOR  
THE NEW  
12-PAGE  
ALPHA  
CATALOG.

**ALPHA PLASTICS INC.**  
OKNER PARKWAY, LIVINGSTON, N. J.

Check 1997 opposite last page.

CHEMICAL PROCESSING



## CORROSION CONTROL

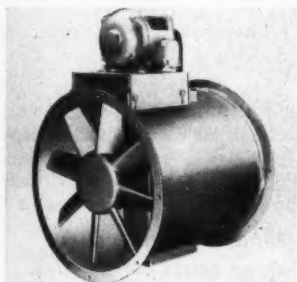
**Belt driven duct fan  
for corrosive areas,  
extreme temperatures**

Blade design produces higher pressures, minimizes noise

**Uses:** For corrosive atmospheres and extreme temperature ranges.

**Features:** Blade design produces higher pressure characteristic while reducing noise to minimum.

**Description:** Constructed of rolled, heavy-gage steel plate, fan is continuously welded at points of junction with angle iron flanges. It is jig punched and stitch welded to drum at both ends. Bearings are mounted inside air-insulated belt housing. This enables motor, which is located out of air stream, to be positioned either horizontally or vertically.



New blade design of duct fan produces higher pressures, reduces noise to minimum

ly. Fan blade is shaped like an airplane wing and insures complete air pattern. Sizes range from 12 to 72" with either 2, 4, 6, or 8 bladed steel or aluminum wheels, depending upon specifications.

(Belt driven duct fan is product of Chicago Blower Corp., Dept. CP, 9863 Pacific Ave., Franklin Park, Ill.)

Check 1998 opposite last page.

### **Stainless fastenings catalog**

Over 7000 items are listed in stainless steel fastenings catalog. Cat 56-A — Star Stainless Screw Co., Dept. CP, 655 Union Blvd., Paterson 2, N. J.

Check 1999 opposite last page.

**Still Another AMERICAN First!**

# LIQUID

# WINDSOR FELTS FOR FILTRATION

**OUTLAST ALL OTHER FILTER MATERIALS 10 to 1**

Windsor Felts are unique, fiber bonded, non-woven structures, engineered to serve as economical and efficient filter media for industrial processing. Quick facts:

- Greater product recovery
- Easy cake release
- Can be hosed off without taking from press
- Can be re-used indefinitely
- Produce less plugging
- Do not shrink, are ravel-free and produce clean-cut edges
- Reduce leakage
- Have unusual stability
- Temperatures to 250F

These outstanding properties make Windsor Felts highly suitable for use

on plate and frame, pressure leaf, rotary vacuum, cartridge or specialty filters.

The Engineering and Research Division invites your inquiry and will be pleased to work with you on your specific filtration problem and make recommendations.

For the newest in economical filter material send for Data Sheet #18 WINDSOR FELT-LIQUID FILTRATION, making request on your firm's letterhead.



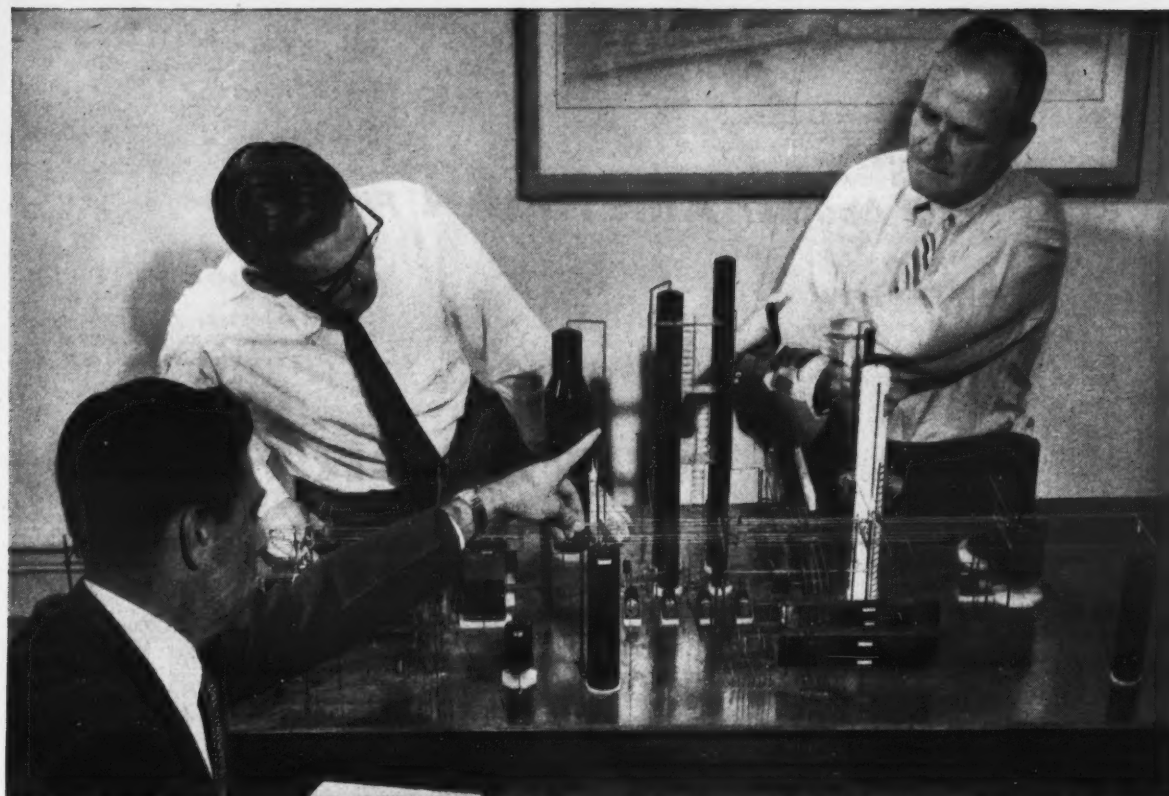
## American Felt Company



**GENERAL OFFICES: 96 GLENVILLE ROAD, GLENVILLE, CONN.**

SALES OFFICES: New York, Boston, Chicago, Detroit, Cleveland, Rochester, Philadelphia, St. Louis, Atlanta, Greenville, S.C., Dallas, Boynton Beach, Fla., San Francisco, Los Angeles, Portland, San Diego, Seattle, Montreal.—PLANTS: Glenville, Conn.; Franklin, Mass.; Newburg, N.Y.; Detroit, Mich.; Westerly, R.I.—ENGINEERING AND RESEARCH LABORATORIES: Glenville, Conn.

Check 2000 opposite last page.



F. J. Tompkins, Chief Design Engineer (right), Bernard Anik, Mechanical Engineer (left rear), Singmaster & Breyer, N. Y. C. Foreground, Michael De Piano, Cooper Alloy Corp.

## TOMPKINS and ANIK of SINGMASTER & BREYER tell why they build Cooper Alloy stainless valves into their basic plant designs

**Q. Gentlemen, precisely why do you buy Cooper Alloy valves?**

**FJT**—With me, dependability is the main reason. My major concern is overall plant design, and frankly I don't have time to worry about every equipment detail. As specialists in designing and

building "first-of-its-kind" processing plants, we need valves we can count on, and can "build in" as part of our original design. Cooper Alloy valves, we've found, fill that bill.

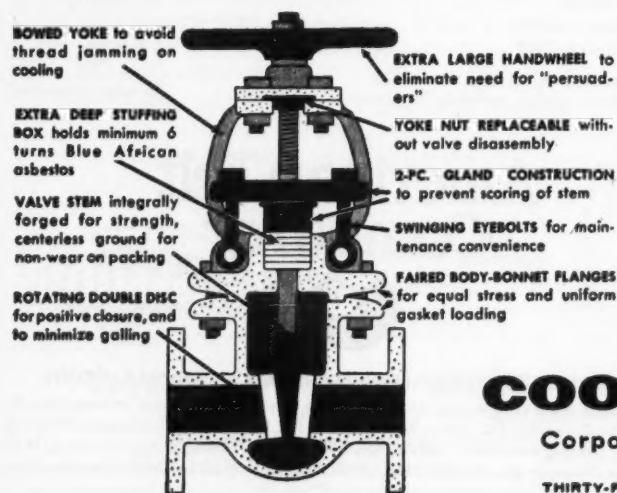
**BA**—From my point of view as a mechanical engineer, it's the Cooper Alloy valve

design that appeals to me. It has extra features, like the extra-large handwheel, unique square compression of packing, bowed yoke, integrally forged stem, and others, all of which make for less maintenance and longer, more economical valve life.

### A VALVE DESIGNED FOR STAINLESS!

The Cooper Alloy valve is not an adaptation of earlier brass and iron patterns. Cooper Alloy, with over 35 years of experience in handling stainless steel, created a valve designed to be cast in stainless! **Check the Special Design Features shown at left.**

As the little CA man below is saying: "You can tell a Cooper Alloy Valve as far as you can see it!" Write today for your copy of our folder "Design Factors In Stainless Steel Valves." The Cooper Alloy distributor near you will be glad to show you the complete line of Cooper Alloy valves and fittings, and their advantages. He can serve you promptly from local stocks.



## COOPER & ALLOY

Corporation • Hillside, New Jersey  
VALVE & FITTING DIVISION

THIRTY-FIVE YEARS OF STAINLESS STEEL PIONEERING

Check 2001 opposite last page.

## CORROSION CONTROL

**Coating retains gloss, resists chalking and fading**

**Minimizes dirt pickup**

**Uses:** For protecting outdoor and indoor surfaces against fumes of acids and alkalis found in industrial atmospheres.

**Features:** Material retains gloss and color. It resists chalking and fading, and keeps dirt pickup to minimum.

**Description:** Protective coating combines chemical resistance of polyvinyl chloride with exceptional weather resistance of acrylic resins. It may be sprayed over suitable primer, or used as gloss finish coat over other protective coatings. Since it contains mild solvents, it can also be applied over most well-adhered paints without wrinkling or lifting.

(Amercoat #35 is product of Amercoat Corporation, Dept. CP, 4809 Firestone Blvd., South Gate, Calif.)

Check 2002 opposite last page.

**Fume removal system stops parts corrosion, ousts acid fumes**

**No sign of deterioration after year of service**

Fume removal, in plating, pickling, and etching department, of Coit Road Plant, Thompson Products, Inc., Cleveland, Ohio, is accomplished through polyester glass fume duct and hood system. The department treats wide variety of parts on both production line and single item basis. Pickles include straight nitric acid at about 35% solution, nitric-hydrofluoric of 30% nitric, and 2% hydrofluoric. Some parts are cadmium-plated, others are chrome-plated, and others pickled and etched. All plating operations take 12 different tanks.

Fume duct system operates on push-pull basis. Three-inch pipes in front of all tanks are drilled out with 1/4" holes. Air is blasted over surface of

## CORROSION CONTROL

tanks from ly toward reduces fa above was fumes from enlarge to system be

Polyester prevents danger

24" duct scrubber

Series o extract ac is then ex plant. PV fume scru charge cl duct, and ester glass and all du acid tank steel.

After m operation 7-day per no sign of sort in p removal s machine to fabrication completely less of we objectional fumes are

(Fume r product o Inc., 908 C mington 8

Check 200

## Corrosion

Glassed c handling chemical industries lustrated Dimension performan cluded. 1 Pumps, In Rd., Seneo Check 200



## CORROSION CONTROL

tanks from these holes directly toward fume hoods. This reduces fan load in chamber above washer. Ducts carrying fumes from hoods are 12" and enlarge to 18" at outer end of system before they join final



Polyester duct and hood system prevents corrosion, and removes dangerous fumes from plant

24" duct feeding into fume scrubber chamber.

Series of jet water sprays extract acids from air, which is then exhausted over roof of plant. PVC lines run from fume scrubber and fan. Discharge chamber, connecting duct, and stack are of polyester glass, as are fume hoods and all duct work. Plating and acid tanks are PVC-lined steel.

After more than a year of operation on 24-hour per day, 7-day per week basis, there is no sign of deterioration of any sort in polyester glass fume removal system. Corrosion of machine tools and parts under fabrication in plant has been completely eliminated, regardless of weather conditions. No objectionable or dangerous fumes are discharged.

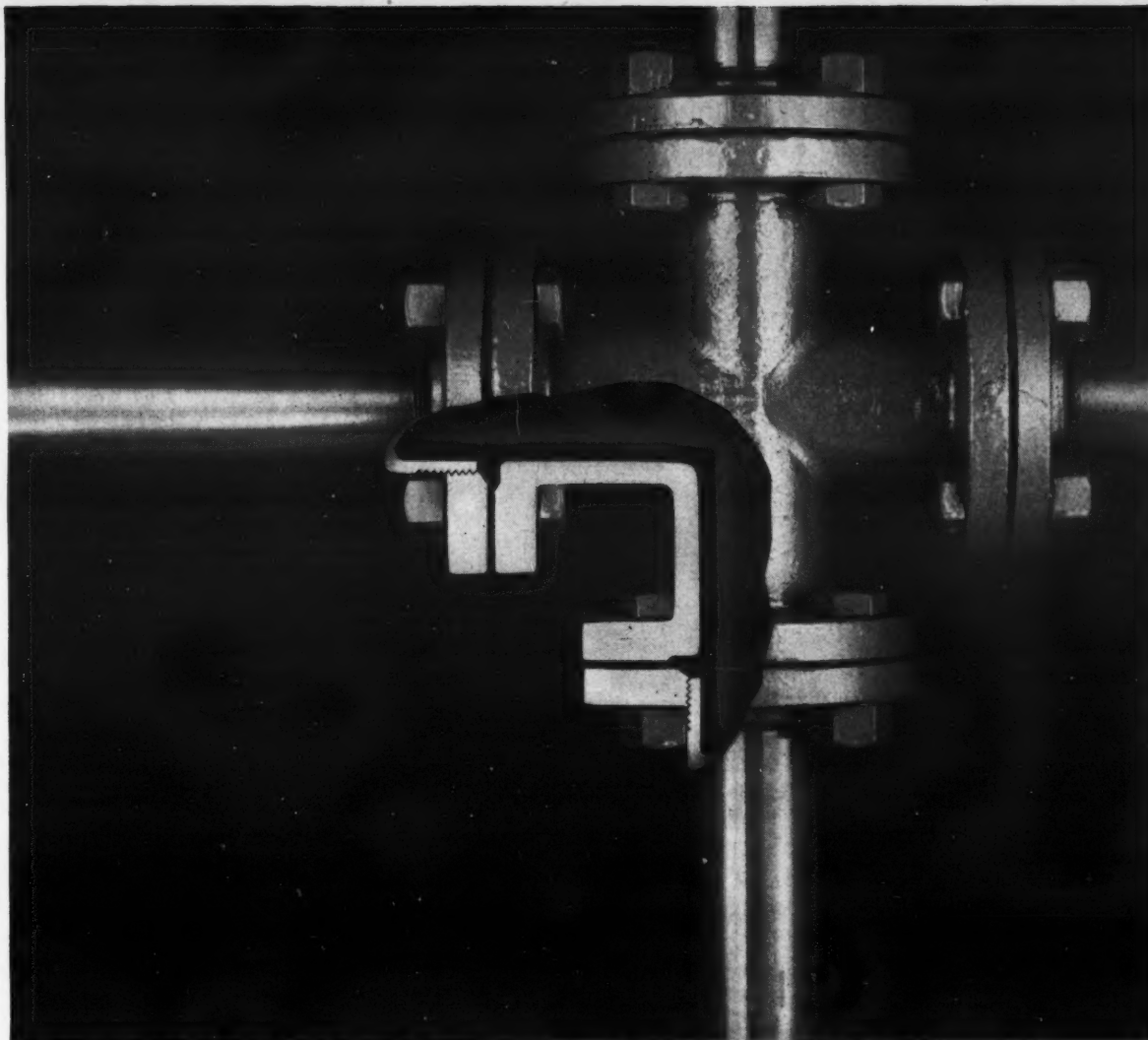
(Fume removal system is product of Haveg Industries, Inc., 908 Greenbank Rd., Wilmington 8, Del.)

Check 2003 opposite last page.

### Corrosion resistant pump

Glassed centrifugal pump for handling corrosive liquids in chemical process and allied industries is described and illustrated in 12-page bulletin. Dimensions, specifications, and performance curves are included. Bul 725.2—Goulds Pumps, Inc., 30 Black Brook Rd., Seneca Falls, New York.

Check 2004 opposite last page.



Corrosive liquids flow from pipe through fittings or valves without touching metal in saran lined piping.

## You can see why saran lined pipe stops shutdowns

*It's corrosion-resistant saran locked within rigid non-bursting steel*

By preventing corrosion, saran lined pipe can stop shutdowns—save labor costs and production loss.

Here is a pipe that resists commonly used acids, alkalis and many other corrosive liquids while having the strength of steel. It can withstand working pressures up to 300 psi. Cast iron and malleable iron fittings and valves are available for pressures up to 150 psi. If you have a high-pressure problem

in your operation, cast steel fittings and valves are available for pressures up to 300 psi.

You'll save labor costs, too, in fabrication. Saran lined pipe can be cut and threaded with conventional hand tools.

For tomorrow's protection today investigate saran lined pipe. THE DOW CHEMICAL COMPANY, Midland, Michigan.

SARAN LINED PIPE COMPANY  
Dept. SP1592B-2  
2415 BURDETTE AVENUE  
FERNDAL 20, MICHIGAN

Please send me information on saran lined pipe, fittings and valves.

Name \_\_\_\_\_ Title \_\_\_\_\_ Company \_\_\_\_\_  
Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_

YOU CAN DEPEND ON



Check 2005 opposite last page.

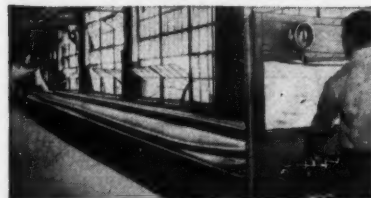


# Pictures tell why PETROCHEM does MORE than fight fire

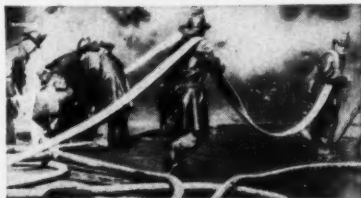


**IT'S RUGGED . . .** stands up to abrasion, resists weather. PETROCHEM'S oil-resistant Neoprene tube is enclosed in a tough, wear-defying Dacron\* jacket. It's a rugged, light, flexible fire hose that wears and wears.

\*Reg. T.M. E. I. Dupont de Nemours & Co.



**IT'S STRONG . . .** strong enough to withstand 500 lbs. pressure and 300°F. temperature.



**IT'S OIL AND CHEMICAL RESISTANT . . .** fights off deterioration both inside and out.



**IT'S FLEXIBLE . . .** so flexible it takes tight twists without injury.



**IT'S EASILY COILED . . .** requires a minimum of storage space.

These are the reasons why it will pay you to consider PETROCHEM fire hose in your safety planning. Your Quaker-Quaker Pioneer distributor provides extra-fast service. See him today. For more information, please write to: H. K. Porter Company, Inc., QuakerRubber Division, Philadelphia 24, Pa., or Pittsburg, Calif.

**H. K. PORTER COMPANY, INC.**  
QUAKER RUBBER DIVISION

Check 2006 opposite last page.

## CORROSION CONTROL

### High cost of plastic ducts offset by increased corrosion resistance

Improved properties expected  
in near future

In most instances the initial cost of plastic exhaust hoods, ducts, or stacks is higher than that of coated steel or metals. For example, the initial cost of a typical straight duct section 24 x 24 x 60" long would be approximately the following in these various materials:

Mild steel, 14vGa	\$25
Aluminum, 20 gage	90
Stainless, 20 gage	90
Mild steel with 3/32" thick PVC lining	145
Solid rigid PVC, 1/8"	120
Glass-polyester, 3/16"	125

The high initial cost of various plastic materials of construction is offset by the exceptional chemical resistance of these products. Not only are replacement or maintenance costs kept to a very low level, but — more important — they overcome costly operational shutdowns.

### Thermoplastic Materials

Among the thermoplastic materials presently available the following must be included:

Polyvinyl chloride  
Polyethylene  
Styrene-butadiene copolymers  
Fluorocarbons

Rigid or unplasticized polyvinyl chloride is the predominant material in this group. This plastic has high strength, extremely wide range of corrosion resistance, and the ability to be easily fabricated and joined. Higher temperature limits may be achieved in the near future.

Use of polyethylene in duct systems has increased but is still somewhat limited due to low heat limit and relatively low strength. Introduction of low-pressure polyethylene promises improved strength and heat resistance as well as resistance against solvents and highly oxidizing conditions. Hence, polyethylene may ultimately prove to be the most

versatile plastic for exhaust systems.

Styrene-butadiene copolymers have higher heat distortion than PVC and have high impact strength. However, joining problems and relatively low stiffness has kept use of this plastic in exhaust equipment at a low level.

Use of fluorocarbon polymers in exhaust equipment has been even more limited due to the exceedingly high cost as well as the lack of fabrication techniques. In view of their almost absolute inertness against almost all corrosive vapors, fluorocarbon polymers may ultimately prove to be the ideal material construction — particularly if prices are lowered.

### Thermosetting Materials

Among the thermosetting plastics, the following types must be included:

Phenolic resins (reinforced)  
Furane resins (reinforced)  
Polyester resins (reinforced)  
Epoxy resins (reinforced)

Phenolic and furane resins — reinforced with acid-digested asbestos or glass fiber — have enjoyed extensive use in equipment handling corrosive vapors longer than any other plastic. Phenolic and furane compounds can be formulated to meet specific corrosive operating conditions. They are relatively insensitive to thermal shock and offer a wider temperature operating range than any other plastic currently being used in exhaust systems, about 300°F.

More recently, glass-reinforced polyester resins have made the greatest advance in the thermosetting group for use in exhaust systems. Improvements have been made in the quality of the polyester resins available, particularly with respect to resistance against alkalis. A very recent improvement consists of using reinforcement material made of special mechanically interlocked felts composed of corrosion-resistant synthetic fibers.

Use of epoxy-glass fiber reinforced resins in chemical exhaust systems has been rather limited. However, their

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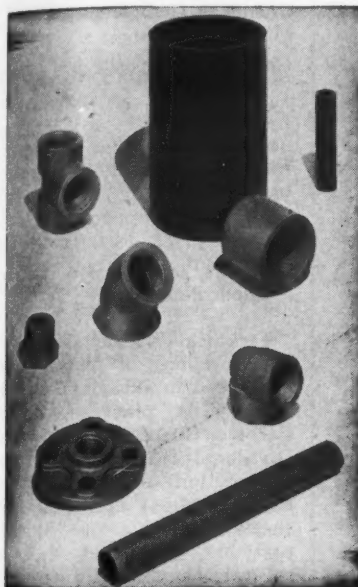
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CHEMICAL PROCESSING

# LUZERNE

## PVC PIPE & FITTINGS

Will  
Help Solve Your  
Corrosion Problems!



Having trouble with corrosion or internal build-up of slime and scale in your piping? The smooth inside surface of LUZERNE rigid, unplasticized Polyvinyl Chloride Pipe and Fittings means less of this difficulty; and because it's non-metallic, electrolytic action is eliminated, too. LUZERNE PVC Pipe and Fittings are light in weight, easy to install with either screwed fittings or welding socket fittings, and economical. Sizes  $\frac{1}{4}$ " to 12". Large sizes on request.

SEND FOR BULLETIN PF 1200

LUZERNE offers an improved and expanded line of HARD RUBBER VALVES for Chemical Applications. . . Flanged or . . . Threaded Screw Stem Straight Way Valves . . . Screw Stem Angle Valves . . . Globe Valves . . . all with improved Du Pont Teflon packing.



See  
LUZERNE  
EXHIBIT  
in  
BOOTH  
NO. 435



The LUZERNE RUBBER CO.

200 Muirhead Avenue Trenton, N. J.

Check 2007 opposite last page.

NOVEMBER 1957

### CORROSION CONTROL

resistance to certain oxidizing conditions may be of great interest in specific applications.

(Condensed from technical paper, "The Present Status of Plastic Stacks and Ducts in the Chemical Process Industry," which was presented at the 1957 Annual Meeting of the National Association of Corrosion Engineers in St. Louis. Paper was prepared by J. L. Huscher, Kaykor Industries, Inc., Div. of Kaye-Tex Mfg. Co., Yardville, N.J.)

Check 2008 opposite last page.

### Controlled volume pump

Specifications and latest design features of manufacturers motor-driven controlled volume pumps designed for precise metering and pumping of corrosive liquids against pressure are contained in 32-page bulletin. Bul 553-1—Milton Roy Company, Dept. CP, 1300 E. Mermaid Lane, Philadelphia 18, Pennsylvania.

Check 2009 opposite last page.

Eliminate shutdowns,  
high maintenance,  
with PVC fan

Operates in any position

Uses: For industrial corrosion exhaust systems.

Features: Unit eliminates costly production shutdowns and high maintenance costs in plating, etching, pickling, and anodizing operations.

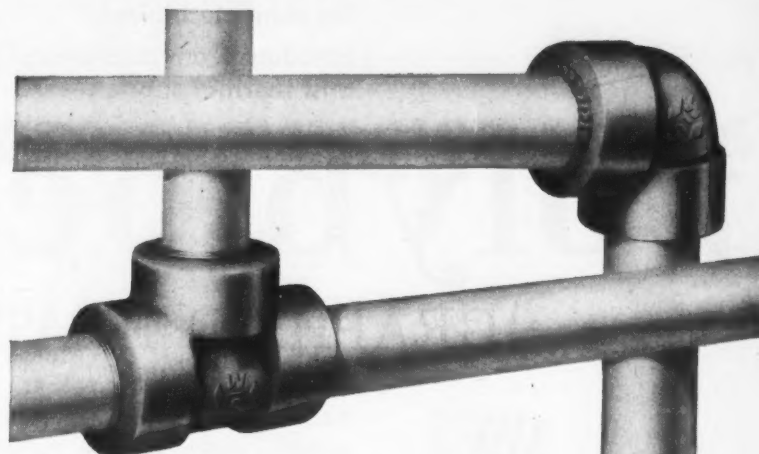
Description: Polyvinyl chloride tube-axial fan has semi-pressure wheel and air foil blades.


Sealed inner housing of PVC welded construction protects belts and pulleys from corrosive air. Fan has Teflon packing gland with stainless steel drive shaft. Ball bearing main drive includes extension for lubrication. Fan operates in any position.

(PVC tube-axial fan is available from Industrial Plastic Fabricators, Inc., Endicott St., Norwood, Mass.)

Check 2010 opposite last page.

When **HEAT** or **CORROSION** Add to  
Your Pressure Piping Problems . . .



Protect Pipe Joints with . . . 

## FORGED STAINLESS or ALLOY STEEL FITTINGS

IN CORROSIVE SERVICE your pipe joints take a beating—fluid velocity and turbulence accelerate corrosion wherever there is a change in direction of flow.

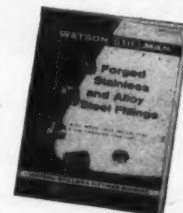
AT HIGH TEMPERATURES structural changes in the metal can cause loss of strength and subsequent failure.

Those are good reasons for "playing it safe" in high pressure service with W-S Forged Stainless or Alloy Steel Pipe Fittings. W-S Stainless Fittings resist corrosion in a wide variety of process liquids and gases and high temperature steam. Available in Types 304, 316 and 304 L.

W-S Alloy Steel Fittings resist oxidation and graphitization and retain their high strength in high pressure—high temperature steam lines. Three alloys available—1 $\frac{1}{4}$ % Chrome- $\frac{1}{2}$ % Molybdenum and 2 $\frac{1}{4}$ % Chrome-1% Molybdenum and 4-6% Chrome- $\frac{1}{2}$ % Molybdenum.

W-S Forged Stainless and Alloy Steel Fittings can be obtained in Screw-End Type for 2,000 lb., 3,000 lb., and 6,000 lb. WOG service; Socket-Welding Type for Schedules 40, 80, 160 and Double-Extra Heavy Pipe. Send today for bulletin S-1-55.

Write to W-S Fittings Division, H. K. Porter Company, Inc., P.O. Box 95, Roselle, N. J.



## H. K. PORTER COMPANY, INC.

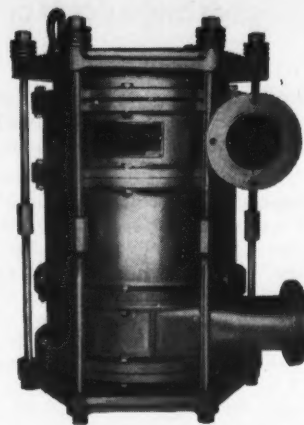
W-S FITTINGS DIVISION

Check 2011 opposite last page.

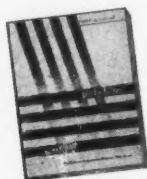


- No fragile tubes
- No danger from leakage
- Complete corrosion resistance
- No cemented joints
- Freedom from mechanical and thermal shock

# polybloc



## → GRAPHITE HEAT EXCHANGER



Write for  
14-page  
Engineering  
Manual

VISIT US AT THE 1957  
CHEMICAL SHOW,  
NEW YORK COLISEUM —  
DECEMBER 2-6,  
BOOTH NO. 803.

The "Polybloc" Graphite Heat Exchanger is constructed of high strength, molded graphite blocks which are impervious to acids, alkalis and solvents. These stacked blocks are held in compression by

external spring loaded tie bars to insure ruggedness, freedom from shock and leakage. In addition, this construction eliminates the need for cemented joints or fragile tubes.

**Quick Delivery • Guaranteed Performance • Designed to Meet Your Specifications**

THE CARBONE CORPORATION



BOONTON, NEW JERSEY

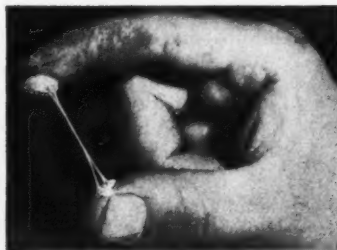
Check 2012 opposite last page.

Lock out those tough



# LEAKS

Tacky and sticky  
enough to hold on  
to any surface.  
Smooth and creamy  
in texture . . . not  
porous or grainy.  
Sets up a springy  
elastic seal that  
seems "alive".



Leak Lock is a special purpose joint sealer designed to solve difficult leaking joint problems in all industries. It has been notably successful in the chemical, petroleum, atomic energy, electronic and refrigeration fields.

The plastic resin base stays elastic, thus eliminating the inefficient hard, crumbly texture found in ordinary sealing compounds. It is not affected by temperature or by vibration. Try it yourself. Highside Chemicals Incorporated, 16 Collax Avenue, Clifton, N. J.

Send for FREE  
SAMPLE on your  
business letterhead

*Leak Lock*

Check 2013 opposite last page.

Get these Facts and Figures FREE!

Republic ELECTRUNITE®

WELDED STAINLESS STEEL TUBING  
AND PIPE WALL CHART

Decimal equivalents, tolerances, chemical analysis, physical properties . . . facts and figures for all sizes and shapes of Republic ELECTRUNITE Welded Stainless Steel Tubing. Attractive 18½ x 20½" wall chart FREE! Write today!

Check 2014 opposite last page.

## CORROSION CONTROL

### Plastic tank lining

Detailed information on flexible thermoplastic, chemical-resistant lining for storage tanks, processing tanks, medium-to-large diameter pipes, and fittings, fume ducts, and hoods is found in 18-page illustrated booklet. Bul 171-77 —Plastics Dept., The Dow Chemical Company, Midland, Michigan.

Check 2015 opposite last page.

### Hot spray increases vinyl coating thickness

Lowest labor costs, makes application easier

Technical paper tells how hot spraying of vinyls has been used to advantage at the Texas City plant of Union Carbide Chemicals Company, Division of Union Carbide Corporation. Although vinyls have excellent corrosion resistance, disadvantage in the past has been that it took several coats to build a satisfactory film thickness of five mils. Hot spraying has made it possible to obtain three mils per coat.

Hot spray has expanded the field of spray application and done a better job — and all this with less skill required on the part of painters and for a lower total cost. Indications are that hot spray is at least doubling the life of vinyls in the more severe exposures.

At the Texas City plant, vinyl coatings have been applied by hot spray on about 700,000 sq ft of plant area. In the hot spray application, paint is delivered to the gun at about 160°F. This temperature causes immediate evaporation of much of the solvents. This solvent evaporation depresses the temperature of the paint so that it is ambient or slightly above when it strikes the surface. This solvent release increases the viscosity of the vinyl coating, providing a much greater film thickness without sag.

One advantage of hot spray is the reduction of overspray primarily due to lower pot

## CORR

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## FOR M INFORMATION

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# Immediate delivery!

## LOW COST ROTARY PUMPS FOR SEVERE CORROSIVE SERVICE



AROMATICS  
NITRIC ACID  
HYDRAZINE  
HYDROGEN PEROXIDE  
MERCURIC SULPHATE  
HYDROCHLORIC ACID  
TITANIUM TETRACHLORIDE  
SULPHURIC ACID  
AND OTHER  
SEVERE CORROSIVES

PRICES  
START AT  
**\$75**

Whether you're handling acids or alkalis—viscous or non-lubricating fluids—there's an Eco ALL-CHEM rotary pump for the job.

Choose from these corrosion-resistant materials of construction:

**HOUSINGS**—Bronze, 304, 316 and Carpenter 20 stainless, Hastelloy C, Monel

**SHAFT SEALS**—Teflon packing rings or exclusive fluid Teflon stuffing box seal

### CHECK THESE ECO FEATURES:

- Capacities to 10 gpm, pressures to 100 psi.
- Viscosities to 900 SSU.
- Linear non-surfing delivery.
- Self-priming with non-volatile liquids.
- All parts interchangeable and in stock.
- V-belt, variable speed, air or electric motor drives.
- Adaptable for agitating, pumping shear-sensitive fluids under pressure and for constant flow metering.

If you have a pumping problem that involves corrosive fluids, write or 'phone Eco. Our engineering advisory service is at your disposal. Write for bulletins AC56 and FT56.

*the big name in small pumps*

**ECO**  
**ENGINEERING COMPANY**  
12 NEW YORK AVE., NEWARK, N. J.  
MARKET 4-6565



Check 2018 opposite last page.

## CORROSION CONTROL

**Aluminum-coated steel  
is durable material  
for weather shields**

Used on towers by Magnolia Petroleum Company

Combination of strength and corrosion resistance qualify aluminum-coated sheet steel for use as protective covering on 14 x 30' disengager located atop 230' high tower. Durable material was also used to shield reactor, 90' high with 13' 9" diameter, from driving winds and rain, and to provide insulation by reflecting radiant heat.



This reformer reactor and a cracking unit catalyst disengager are two of seven high-temperature vessels protected by aluminized steel, in the Magnolia Petroleum Company refinery, Beaumont, Texas.

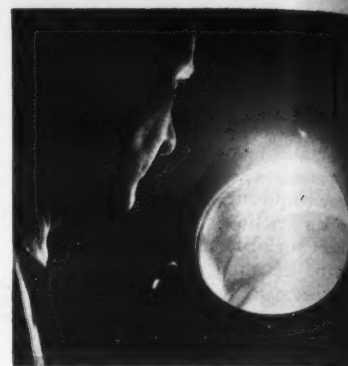
(Aluminized Steel Type 2 is product of Armco Steel Corp., Middletown, Ohio.)

Check 2019 opposite last page.

### Entrainment separator

Bulletin of four pages details impervious graphite entrainment separator and explains how efficient, corrosion-resistant equipment separates entrained liquids from gas streams. Cat. Section S-6900—National Carbon Company, Division of Union Carbide Corporation, Dept. CP, 30 E. 42nd Street, New York 17, New York.

Check 2020 opposite last page.

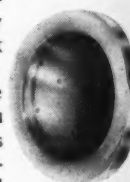


## How to help prevent corrosion in a sight glass

PYREX® brand sight glasses stay clear longer because they resist the corroding and pitting effects of all chemicals except HF or strong, hot caustic solutions. No chance for an opaque build-up to prevent you from seeing the inside story when you use PYREX sight glasses.

You should use these glasses whenever you work with materials under heat and/or pressure. They withstand high temperatures and sudden changes of temperature, and will remain transparent through a long service life.

PYREX mold finished glasses are recommended for use when pressures are low or low pressures are accompanied by high temperatures.



PYREX annular edge glasses are designed for use on pressure vessels. They will safely withstand pressures up to 450 p.s.i. and temperatures up to 500 F.

There is a PYREX sight glass to fit your particular application. Let us send you a copy of Bulletin EB-20, which describes the properties, specifications and application of these glasses.



*Corning means research in Glass*

**CORNING GLASS WORKS**  
CORNING, N. Y.

Please send me a copy of Corning Sight Glass Bulletin EB-20.

Name.....

Company.....

Address.....

City..... Zone..... State.....

Check 2021 opposite last page.

CHEMICAL PROCESSING





1  
if by  
hand

2  
if by machine

Alconox the world famous hospital and laboratory detergent now has a twin brother.

Whether you wash your delicate glassware, instruments and equipment by hand or by machine, we have the product that will do the job faster, better and safer than any detergent now on the market.

Paul Revere's message was dictated by the signal from Old North Church.

Your decision is dictated by the washing method your laboratory uses.

**ALCONOX for all equipment washed by hand:**

**ALCOJET for all equipment washed by machine:**

Alconox available in:	
Box of 3 lbs.—price	\$ 1.95
Carton (12 boxes of 3 lbs.)	18.00
Drum of 25 lbs.	lb. .45
Drum of 50 lbs.	lb. .42
Drum of 100 lbs.	lb. .40
Barrel of 300 lbs.	lb. .37
(slightly higher on West Coast)	

Alcojet available in:	
Box of 5 lbs.—	\$ 3.00
Case (6x5 lbs.)	15.00
Drum of 25 lbs.	lb. .45
Drum of 50 lbs.	lb. .42
Drum of 100 lbs.	lb. .40
Drum of 300 lbs.	lb. .37
(slightly higher west of the Rockies)	

Order from your favorite supplier  
or write for literature and samples.

**ALCONOX Inc.**  
853 BROADWAY, NEW YORK 3, N.Y.

Check 2022 opposite last page.

NOVEMBER 1957

## CORROSION CONTROL

**Portable testing instrument  
measures thickness  
from 0.025 to 5"**

Tests corrosive effects  
in the field

**Uses:** For field work such as testing corrosive effects on storage tanks; finding thin spots in walls, laminations, eccentricity in cored castings and cast iron pipe, lack of bond, and many other defects.

**Features:** Light-weight unit can easily be carried by means of shoulder straps. It measures thickness from 0.025 to 5" with only three crystals.



Light-weight battery-operated unit measures thickness

**Description:** Portable resonant ultrasonic instrument measures thickness from one side as rapidly as crystal probe is touched to test surface. Its accuracy is  $\pm 2\%$ . Unit is battery-operated.

(SO-200 portable Sonizon is product of Magnaflux Corp., 7300 W. Lawrence Ave., Chicago 31, Illinois.)

Check 2023 opposite last page.

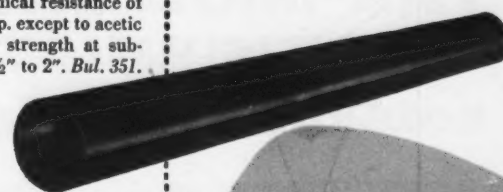
### Plastic pipe and fittings

Applications, chemical resistance ratings, electrical properties, physical properties, working pressures and pressure drop of plastic pipe and fittings are covered in 16-page catalog. Form 10M 557—Plastic Pipe Division, Triangle Conduit & Cable Co., Inc., Dept. CP, New Brunswick, New Jersey.

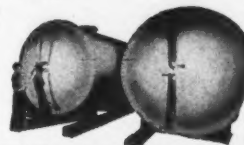
Check 2024 opposite last page.

## STAYS TOUGH AT SUB-ZERO TEMPERATURES

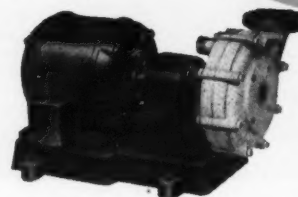
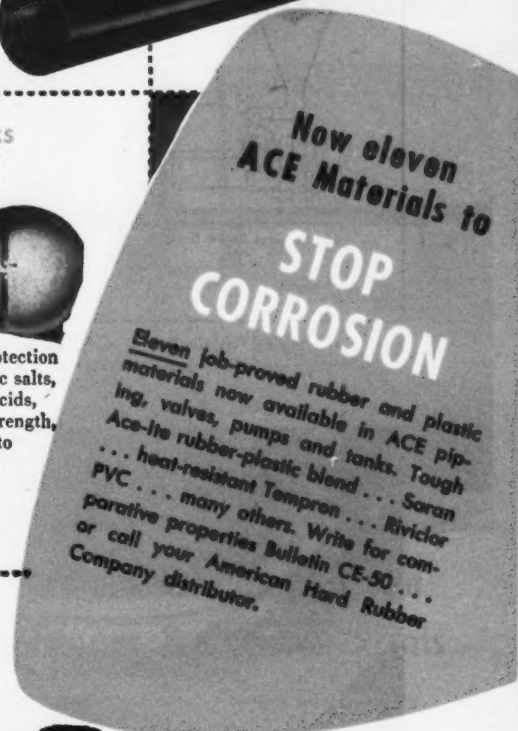
**ACE PARIAN** . . . odorless, tasteless, rigid polyethylene. Best chemical resistance of any plastic at room temp. except to acetic acid. Excellent impact strength at sub-zero temp. Rigid pipe  $\frac{1}{2}$ " to 2". *Bul. 351.*



**LIFE-TIME  
ACID STORAGE TANKS**  
Rubber-lined by ACE  
2-layer system



Economical, universal protection against all alkalis, metallic salts, practically all inorganic acids, hydrochloric acid any strength, sulphuric to 50%, nitric to 20%, phosphoric to 75%. Good to 160 deg. F. . . . sometimes higher. Soft rubber interlayer aids shock resistance.



**ACE "WAM" . . . THE FINEST**  
Non-metallic Acid Pump

On job after job, this 80-gpm. centrifugal pump has earned highest praise. Hard rubber casing and impeller, Hastelloy C shaft. Handles nearly all corrosives. Mechanically simple, trouble-free. *Bulletin CE-55.* Larger ACE pumps available.



**NEED SPECIAL FITTINGS,  
COVERS, TANKS, PARTS?**

If you want life-time corrosion protection for special parts needed in quantity . . . we may save for you by molding them of ACE hard rubber or plastics to your most exacting requirements. Our facilities among world's largest. Ask for recommendations.

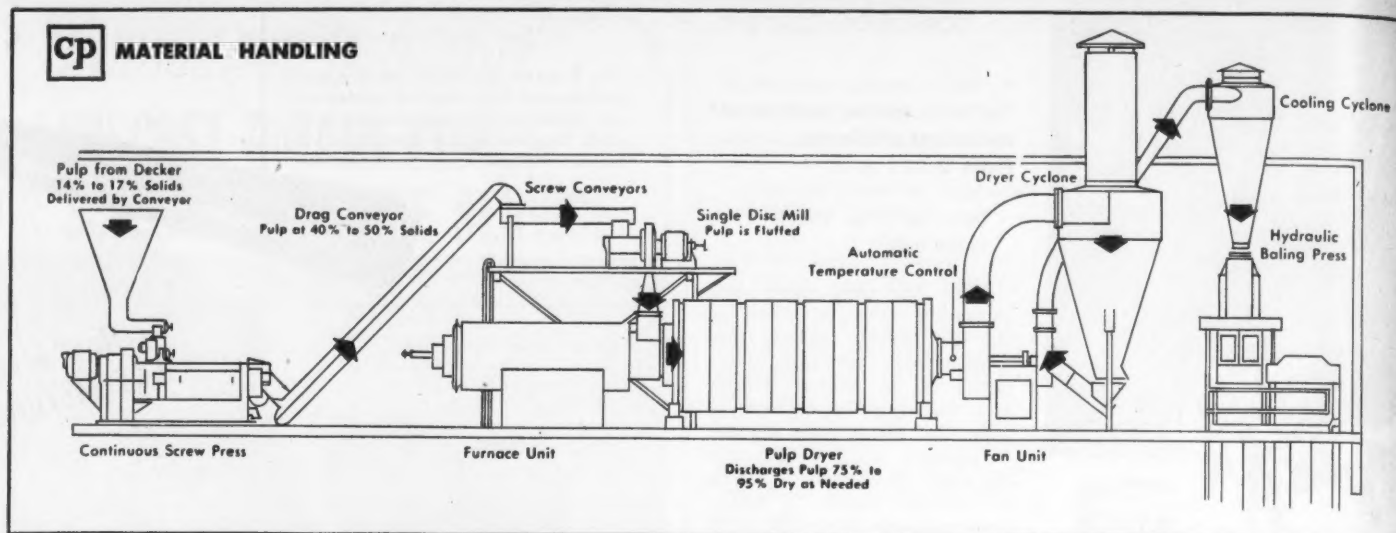


**ACE** processing equipment of rubber and plastics

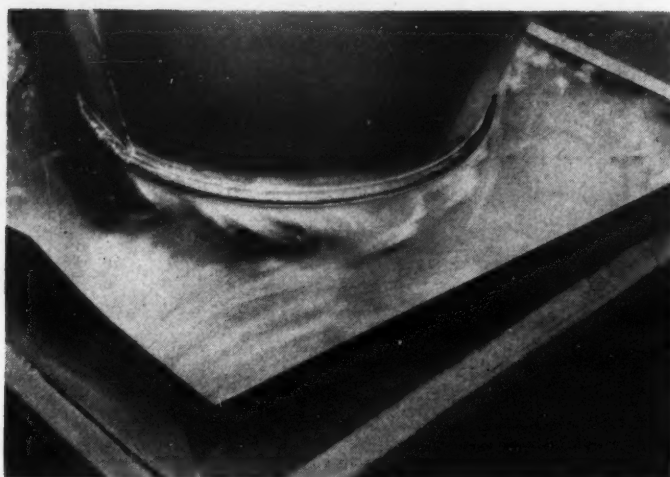
**AMERICAN HARD RUBBER COMPANY**  
DIVISION OF AMERACE CORPORATION  
Ace Road • Butler, New Jersey

Check 2025 opposite last page.





Typical installation of pulp drying and baling system which produces material with low moisture content



Resulting pulp is dry enough to handle in pneumatic systems. Note "airiness" of material prior to being baled

Baling machine makes bales of dry pulp measuring 2 x 2 x 4 ft and weighing 700-800 lb



#### Unique wood pulp drying and baling system:

- removes 95% of the water
- requires only two men per shift to produce 150 tons/day, and

## Prepares pulp less costly to handle, ship

A recently developed drying and baling system turns out pulp that will be far less costly to handle and ship. Reason: Process produces material with low moisture content — up to 95% of the water is removed. With other methods, pulp being shipped contains anywhere from 40 to 60% water — both shipper and ultimate user pay unwanted shipping expense. In addition, low-moisture pulp has a measurably reduced tendency for microbiological deterioration.

System can be used with wide variety of pulp and is adaptable to meet specific requirements of individual mills. Basic steps in the operation are:

■ Pulp is dewatered by conventional means, such as a vacuum decker, to approximate range of 14 to 17% solids, and then shredded.

■ Pulp is 50% solid screw press

■ Disc or (or hammer) pulp, enabled by an remaining

■ Drying involving pulp material water rem

■ Dried pulp air stream density bales ft and wei depending requirements

Pulp d combination tem of hi controlled maintain 2°F. Total hot air str than one n never exc charge, el ties of su

High-de operates v of over 1 producing range of Bales strapped, can be and unst matic bal about 15 k

Single stalled to tons per requireme by putting ers and b stallation per day sq ft wi System is two opera shift to p

Tests in well with bleached semi-chem wood pul there is a brightness

Repulp taking le conventio slight bea mal or and tear

(Bauer-E developed Springfie

Check 20

■ Pulp is then reduced to 40-50% solids in conventional screw press or roll press.

■ Disc or double-disc mill (or hammer mill) fluffs the pulp, enabling it to be carried by an air stream through remaining operations.

■ Drying in three-pass revolving pulp dryer produces material with 75 to 95% of the water removed.

■ Dried pulp, still carried by air stream, is fed into a high-density baling press producing bales measuring 2 x 2 x 4 ft and weighing 700 to 800 lb, depending upon shipping requirements.

Pulp dryer is heated by combination gas-oil fuel system of high efficiency. It is controlled automatically to maintain temperatures within 2°F. Total exposure time to the hot air stream in dryer is less than one minute, and the pulp never exceeds 130°F at discharge, eliminating possibilities of surface hardness.

High-density baling press operates with platen pressure of over 1-1/3 million pounds, producing bale density in range of 45 to 60 lb/cu ft. Bales can be wrapped, strapped, or palletized, or they can be shipped unwrapped and unstrapped. One automatic baling press produces about 15 bales an hour.

Single system can be installed to handle 50 to 150 tons per day. Large tonnage requirements can be handled by putting in additional dryers and baling presses. An installation producing 150 tons per day requires about 2000 sq ft with 30 ft headroom. System is automatic — only two operators are needed per shift to produce 150 tons/day.

Tests indicate system works well with unbleached kraft, bleached kraft, unbleached semi-chemical, and ground-wood pulp. In groundwood, there is a very slight drop in brightness — from 66 to 64%.

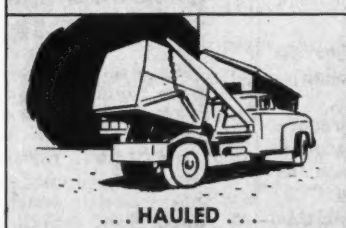
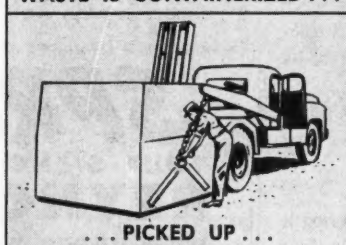
Repulping of bales is quick, taking less than 5 minutes in conventional pulpers. After slight beating or refining, normal or above normal burst and tear values are obtained.

(Bauer-Bale system was developed by Bauer Bros. Co., Springfield, Ohio.)

Check 2026 opposite last page.



**Port Arthur Refinery  
"Containerizes"  
Waste, Rubbish  
and Liquids at Many  
Accumulation Points  
... Hauls and Dumps  
Them With  
Dempster-Dumpsters**



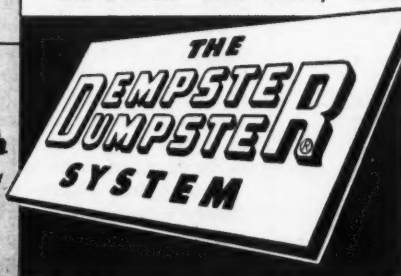
## Dempster-Dumpster Waste Disposal System Serves Leading Refineries & Chemical Plants

Waste disposal and plant cleanliness can no longer be efficiently maintained by wheelbarrows, cans, carts, or bins. Shoveling, re-handling and on-site dumping have been replaced in leading plants by "Containerization" of waste as it accumulates. By placing clean, big-capacity Dempster-Dumpster containers at accumulation points, you can save thousands of dollars annually and enjoy improved plant cleanliness.

The one-man, one-truck Dempster-Dumpster can service over a hundred accumulation points, picking up, hauling and emptying the containers on a planned shuttle schedule. Chemical plants and refineries customarily amortize their equipment investments in 18 months or less. Write today for the free booklet, below.

**FREE: Write Today for Your Copy of  
"How to Reduce Waste Disposal Costs."**

**DEMPSTER BROTHERS, Knoxville 17, Tenn., DEPT. CP-11**



To: Dempster Brothers, Dept. CP-11  
Knoxville, Tennessee

Please Send Without Obligation Your Booklet,  
"How to Reduce Waste Disposal Costs."

NAME.....TITLE.....

COMPANY.....

ADDRESS.....

CITY.....STATE.....



## Lift it the low-cost way

WITH DEPENDABLE HYDRAULIC POWER

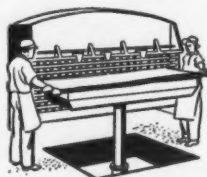


Load trucks from floor level  
... no dock needed



Move traffic from one floor  
level to another

Rotary Levelator Lifts, using dependable, economical oil-hydraulic power, have countless applications in modern industry. Capacities to 100,000 lbs. Standard models and special lifts engineered to your specifications. Write for catalog.



Feed machines, perform other  
industrial lifting jobs



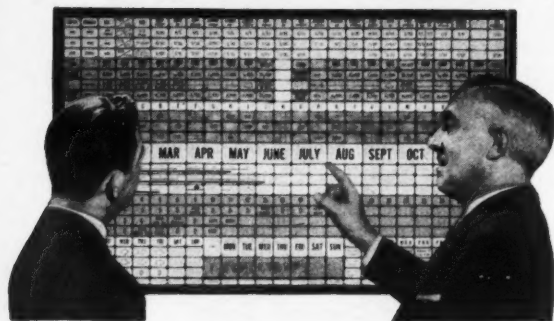
**Levelator® Lifts**

ROTARY LIFT COMPANY

Division of the Dover Corporation  
1023 Kansas, Memphis 2, Tenn. • Chatham, Ont.

Check 2027 opposite last page.

## You Get Things Done Better By Seeing What's Happening



### BOARDMASTER VISUAL CONTROL

- ★ Gives Graphic Picture of Your Operations in Color.
- ★ Easy to Use. Type or Write on Cards, Snap on Board.
- ★ Facts at a Glance - Saves Time and Prevents Errors.
- ★ Ideal for Production, Scheduling, Sales, Inventory, Etc.
- ★ A Simple, Flexible Tool - Easily Adapted to Your Needs.
- ★ Compact, Attractive. Made of Metal. 200,000 in Use.

Complete price **\$49<sup>50</sup>** including cards

**FREE**

24-Page ILLUSTRATED BOOKLET AA-60  
Without Obligation

GRAPHIC SYSTEMS, 55 West 42nd St., New York 36, N.Y.

Check 2028 opposite last page.

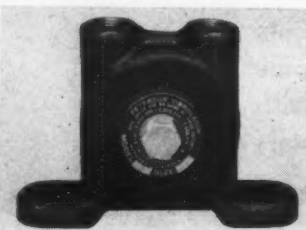
## MATERIAL HANDLING

**Vibrator operates on steam, air or gas**

Ten sizes are available to handle most jobs

Uses: Moving, sifting, settling, conveying, or packing granular materials.

Features: Vibrators operate on steam, compressed air, or gas (smaller units will operate on vacuum). Jet design gives low noise-level operation.



Vibrator operates on steam, air, or gas

Description: Series of models come in ten sizes ranging from few ounces to 15 lb in weight. They are safe and spark-proof in operation.

Inlet and outlet tappings are for standard iron pipe threads. ("Vibrolators" are manufactured by Martin Engineering Co., Neponset, Ill.)

Check 2029 opposite last page.

**Feeder prevents bridging of material in bin**

Available with paddles to give intense bin agitation

Uses: Batching or proportioning of crushed or ground dry bulk materials such as chemicals and additives.

Features: Feeder is variable disc type with agitation pins on discs to keep material in loose condition. Models equipped with paddles are available to prevent packing or bridging of material in bin.

Description: Rate of discharge is accurately controlled and can be varied during operation with hand wheel adjustment.

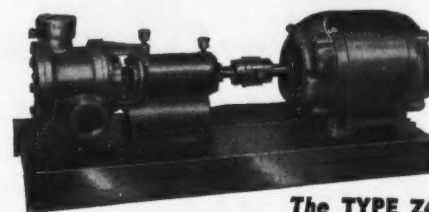
To next page

## Do the Handling of

LIQUEFIED PETROLEUM GASES, REFRIGERANTS  
and other LIGHT NON-VISCOUS LIQUIDS

**Bothersome to You?**

**IT NEED NOT BE**



The TYPE Z4  
**AURORA® APCO Process PUMPS**

WRITE  
for  
BULLETIN  
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**AURORA**  
Always  
PUMPS

You are urged to get acquainted with this complete answer to many of the most difficult pumping tasks of modern industry. The characteristics of the most advanced turbine-type pump, the APCO, combine with special new design features, special metals where required to insure SURE RESULTS. May we tell you more?

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**AURORA PUMP DIVISION**  
**THE NEW YORK AIR BRAKE COMPANY**

62 LOCKS STREET

• AURORA • ILLINOIS

EXPORT DEPARTMENT - Aurora, Illinois - Cable Address "HYARINI"

Check 2030 opposite last page.

**Cut costs—Eliminate messy, sticky, leaky, ball pots, fountain brushes and rollers...**

**SPRAY**  
**YOUR STENCILS WITH**  
**REYNOLDS**  
**QUICK DRYING, WATERPROOF**  
**STENCIL INKS**

Handy aerosol spray container is always ready to use. Nothing to load. No spilling. No brushes to clean. No drying out. Covers quickly. Saves time. Very economical.

9 COLORS. For stenciling cartons, crates, boxes, steel drums, color coding metals and other materials, or any other stenciling on steel, wood, fiber, canvas, glass or other surfaces.

A trial will convince you. Write for full details!

Ask us also about Reynolds Stencil Kover, the very opaque, fast covering blackout fluid. Tan colored to match corrugated cartons. Completely blocks out old stenciling, labels, printing, crayon or painted markings, etc. Dries quickly. Permits re-marking and re-shipment in original cartons—re-stenciling of left over cartons;—or correcting stenciling errors. Packaged in a handy 12 oz. aerosol container.

**REYNOLDS INK, INC.**

4516 Euclid Avenue • Cleveland 3, Ohio

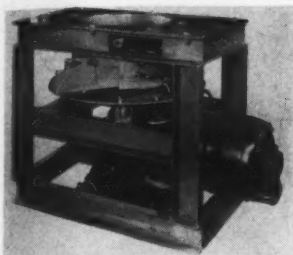
Check 2031 opposite last page.

CHEMICAL PROCESSING



## MATERIAL HANDLING

Several sizes are available. Smallest unit has constant feed range from light trickle to 2000 lb per hour. Larger models can feed up to 80 tons per hour.



Agitation pins on variable disc feeder keep material in loose condition

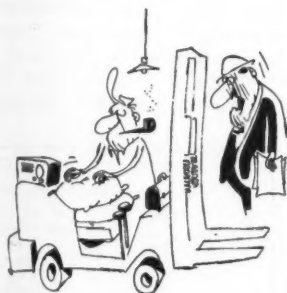
(MECO SRV disc feeder is manufactured by The Manufacturers Equipment Co., Dept. CP, 217 Madeira Ave., Dayton, Ohio.)

Check 2032 opposite last page.

### Versatile screw conveyor

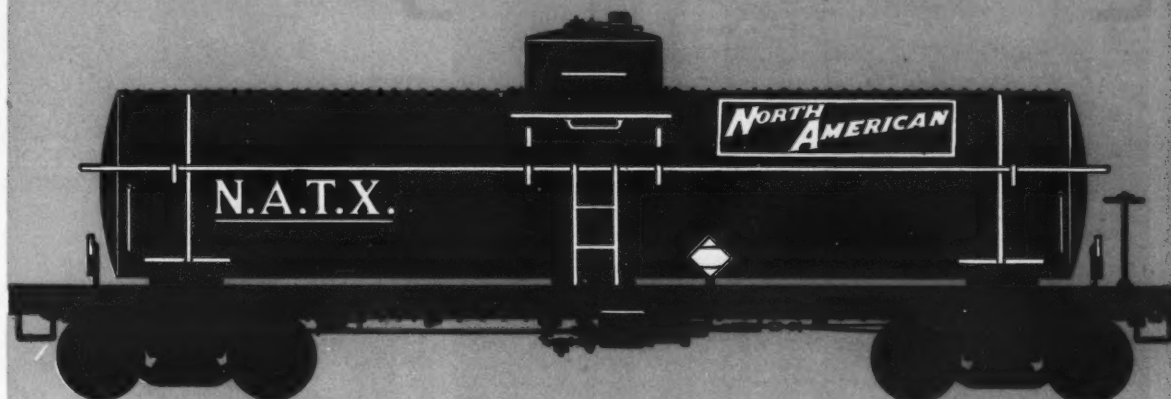
Described as being equally efficient for moving materials horizontally, vertically, at any angle, or in any combination of directions, screw conveyors for handling bulk materials from fine mesh size up to 2" in diameter are subject of manufacturer's bulletin. Bul 957—Canton Stoker Corp., Dept. CP, 300 Andrew Place, S. W., Canton 1, Ohio.

Check 2033 opposite last page.



"Let me know when you get comfy, . . . I have some chemicals to ship."

## THIS CAR DELIVERS



# CHEMICALS

## and customer satisfaction!

Lined especially to requirements, this modern North American chemical car helps you keep customers satisfied. It delivers your product at destination safe, sure, clean and pure as the day of shipment. Special cars

lined by you eliminate contact with metal, corrosive action and contamination . . . they help you build repeat business through your superior service to customers. Specify North American—and get *satisfaction!*



## NORTH AMERICAN CAR CORPORATION

NORTH WESTERN REFRIGERATOR LINE COMPANY  
MATHERS HUMANE STOCK TRANSPORTATION COMPANY

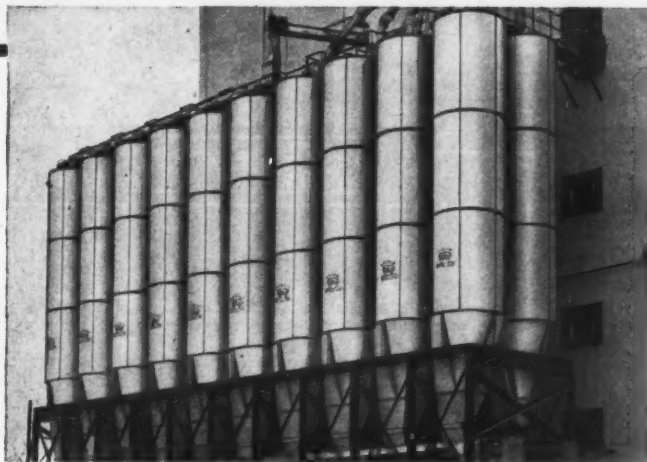
231 South LaSalle Street, Chicago 4, Illinois

A NATIONWIDE ORGANIZATION WITH BRANCH OFFICES IN IMPORTANT MARKET CENTERS

DALLAS • FOND DU LAC • ST. PAUL • ST. LOUIS • TULSA • SAN FRANCISCO • NEW YORK

Check 2034 opposite last page.

## Cut Material Handling Costs with **DAY BULK MATERIAL TANKS**

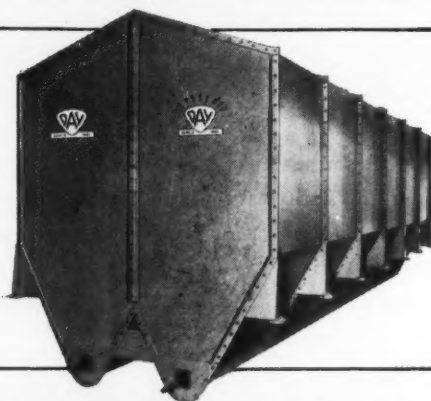


Each of these DAY vertical bulk material tanks has an approximate storage capacity of one carload. They serve as storage tanks for a packaging line as well as for truck and railcar loading. Every day more and more plants find large quantities of dry bulk materials can be handled more economically using DAY bulk material tanks. They save labor, containers and storage costs.

DAY bulk material tanks are made of black iron, galvanized or stainless steel. They are built and shipped in *easily erected, bolted sections*. Vertical tanks are furnished in sizes from 3 to 14 feet in diameter, up to 100 feet high. No support is required above the cone level. Patented, suspension discs are available for vertical type tanks to prevent bridging and assure free flow of product.

### DAY Horizontal Bulk Material Tanks

Using DAY horizontal bulk material tanks, companies report savings of up to 25¢ per bag compared to handling bulk materials in bags. Ideal for buildings with limited headroom. Standard or special sizes available. Low installation cost.



For detailed information on bulk material storage tanks and pneumatic conveying equipment to suit your production and storage needs, write to DAY for Bulletins 529 and 549.



**The DAY Company**



Sold in United States by  
**The DAY SALES Company**

Made and sold in Canada by  
**The DAY Company of Canada Ltd.**

852 Third Ave., N.E., Minneapolis 13, Minn.

P.O. Box 70Y, Fort William, Ontario

Representatives in Principal Cities

**DAY BULK MATERIAL HANDLING SAVES MONEY**

Check 2035 opposite last page.



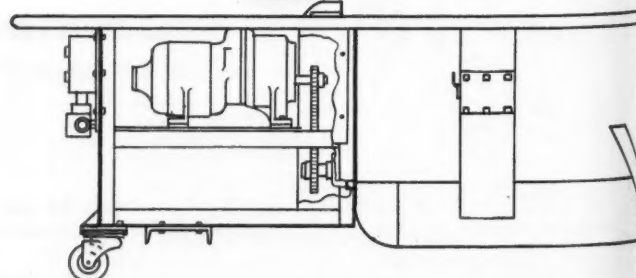
Dearborn Chemical Co., buys some chemicals in bags and stores them in bulk.  
"Bag slitter" attached to pneumatic conveyor . . .

## makes bag-to-bulk transfer easy, fast and dustless

**GEORGE V. MICHAEL**  
Assistant Editor

**R. B. SHEWFELT**  
Maintenance Superintendent  
Dearborn Chemical Co.,  
Lake Zurich, Ill.

Dearborn Chemical Company, at their Lake Zurich, Ill., plant, buys some raw materials in bags, stores them in bulk. This procedure necessitates the transfer of material from bags to storage bins via a pneumatic conveyor. These dry materials are then drawn from the 36 storage bins to formulate some 200 different



CHEMICAL PROCESSING

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NOVEM



## MATERIAL HANDLING

Bags are unloaded, slit and emptied into pneumatic conveying system easily, fast, and with no dust . . . through use of mobile "bag splitter"

water conditioning and corrosion compounds.

A unique device plays an important role in making this bag-to-bulk transfer an easy, fast and dustless operation. Combining the functions of a feeder and a bag splitter, it is an integral part of the system.

Unit measures 6' 10" by 3½'. About half of the top area makes up a table on which one man places bags from railroad car or trailer. A man on each side of feeder then grabs an end of the bag and pulls it toward receiving hopper. A knife blade, in center of table right above hopper-opening, slits bag as the bag passes over the hopper.

In one continuous motion, bag is slit and contents fall into hopper. To assure minimum waste, operators shake emptied bag as it is being removed. Grating inside hopper prevents bags or pieces of bags from falling into hopper. Emptied bags are then discarded. Small screw conveyor in bottom of hopper carries material into pneumatic system. Conveyor motor is mounted under table section.

Device is connected to conveying system by flexible hose. Mounted on wheels, it is easily moved in and out of car as desired. When not in use, it can be stored in some out-of-the-way place. Blade is always covered by metal sheath when not in use.

Upper part of hopper

To next page

In one continuous motion, bags are moved across knife blade (arrow) and are slit causing contents to fall into hopper. Screw conveyor at bottom of hopper feeds material into pneumatic system



## Allis-Chalmers Model D motor grader offers A NEW, SMOOTH APPROACH TO PLANT YARD MAINTENANCE

As more plants utilize their yards for storage, more plant managers are discovering the unusual value of an Allis-Chalmers Model D motor grader. They are discovering it is an ideal yard maintenance machine.

The Model D has all the essential design and performance features of motor graders costing up to three times as much. It keeps plant roads and storage areas smooth and well drained as only a full-fledged motor grader can, yet it is compact enough to work easily where larger machines cannot maneuver.

Further, its unusual versatility keeps the Model D working twelve months a year. With a rear-mounted, 5/8-yd hydraulic loader, it loads excess dirt from windrows, maintains stockpiles, clears and loads snow . . . handles many other jobs that normally call for specialized equipment.

Ask your Allis-Chalmers construction machinery dealer to show you how the Model D can smooth out your yard maintenance problems, or write for complete literature.

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

# ALLIS-CHALMERS



### MODEL D MOTOR GRADER (Choice of two engines)

	Gasoline	Diesel
Brake hp	50	50
Weight (bare)	8,800	9,350
Four forward speeds	to 25.6 mph	to 25.2 mph
Reverse Speed	to 3.3 mph	to 3.2 mph

Optional Equipment—Power Circle Turn, Leaning Front Wheels, Hydraulic Shiftable Moldboard



Hydraulic loader attachment greatly increases the usefulness of the Allis-Chalmers Model D motor grader. Other attachments include scarifier, windrow eliminator, snowplows. Optional cab provides operator comfort the year around.

Check 2036 opposite last page.



It's easier to solve  
your conveying problems

with

# DIAMOND Conveyor Chain

DIAMOND Conveyor Chain's high operating efficiency, precision and versatility make it ideal for conveying and automated operations of all types.

Conveying and synchronizing problems—such as automatic assembly, filling, packaging and folding—are speedily solved by DIAMOND Chain's uniform pitch and smooth action. A wide range of extended pins and attachments permits almost any interval or sequence set-up desired.

For conveying, lifting and transporting—DIAMOND'S toughness, efficiency and long service life help reduce operating and service costs, minimize maintenance.

Where corrosion or product contamination is a problem—DIAMOND Stainless Steel Conveyor Chain supplies the answer.



STRAIGHT ATTACHMENT—one side



BENT ATTACHMENT—both sides



BENT ATTACHMENT—one side



EXTENDED PIN—one side



● Your nearby DIAMOND Distributor can supply all types of conveyor chains and sprockets, plus expert engineering assistance to solve special conveying problems. Look under "Chains" or "Chains, Roller" in the YELLOW PAGES . . . or write to factory for Conveyor Catalog and name of your nearest Distributor.

## DIAMOND CHAIN COMPANY, INC.

A Subsidiary of American Steel Foundries

402 KENTUCKY AVENUE, INDIANAPOLIS 7, INDIANA

Offices and Distributors in All Principal Cities

Check 2037 opposite last page.

## MATERIAL HANDLING

From preceding page

around opening is tied in with pneumatic system. Suction around this portion prevents a dust problem by pulling the dust into the conveying system.

Average unloading time for 1000 bags is about five hours using three men.

(Bag splitter is manufactured by Fuller Company, Subsidiary of General American Transportation Co., Catasauqua, Pa.)

Check 2038 opposite last page.

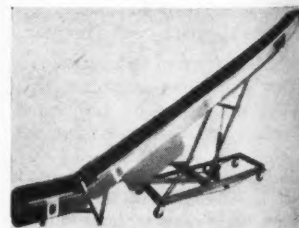
### Points out scale features

Features of manufacturer's scales designed for use in chemical industry are discussed in eight-page bulletin. Illustrations, specifications, and dimensions of models ranging in capacities from 2000 MG up to 100 lb are contained. Form 3333—The Exact Weight Scale Co., 944 W. 5th Ave., Columbus, Ohio.

Check 2039 opposite last page.

### Mobile belt conveyor hydraulically adjusts for high-low jobs

Uses: Unloading, transferring and stacking packages, bags, and boxes. It can also be used as power component in wheel and roller conveyor lines.



Mobile belt conveyor hydraulically adjusts to desired angle

Features: Conveyor is lightweight (construction of aluminum) and is completely mobile. It hydraulically adjusts by finger touch to opti-

## MATERIAL HANDLING

imum height and angle of incline.

**Description:** Available in 10-, 12-, 14-, 16-, 18-, and 20-ft lengths, conveyor operates in both forward and reverse. Non-slip belt, 12" wide, safely elevates at angles to 30° without cleats; for steeper angles, cleats are available.

(Mobile belt conveyor is manufactured by The E. W. Buschman Co., Dept. CP, Clifton and Spring Grove Aves., Cincinnati 32, Ohio.)

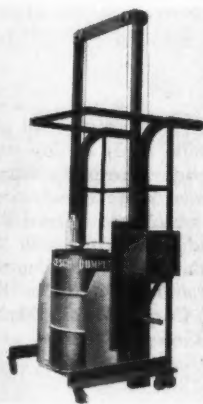
Check 2040 opposite last page.

### Hand-powered dumper adaptable to motor power

**Uses:** For lifting and dumping operations up to 600 lb that preclude use of standard, motor-operated equipment.

**Features:** If necessary, unit can be quickly adapted to motor power.

**Description:** Hand-powered dumper has dumping height ranging up to 7', and can handle as many as 20 loads per



Hand-powered dumper handles free-flowing materials to 600 lb

hour. Swivel and stationary casters make it easy to move about. Various accessories for handling boxes, drums, bags, etc., can be attached to fork-type arms.

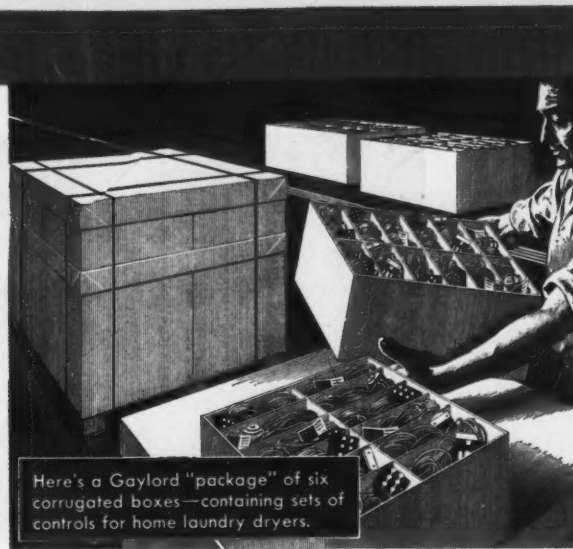
(Cesco Jr. Hand-powered Dumper is product of Essex Conveyors, Inc., 165 Franklin Ave., Nutley 10, N.J.)

Check 2041 opposite last page.



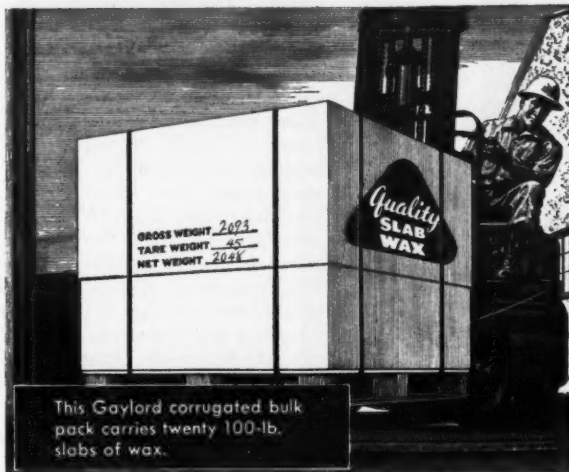
Each of these Gaylord Drumpaks holds 2,000 lbs. of bulk chemicals, replaces twenty 100-lb. units.

... save 20 to 25 manhours per car ...



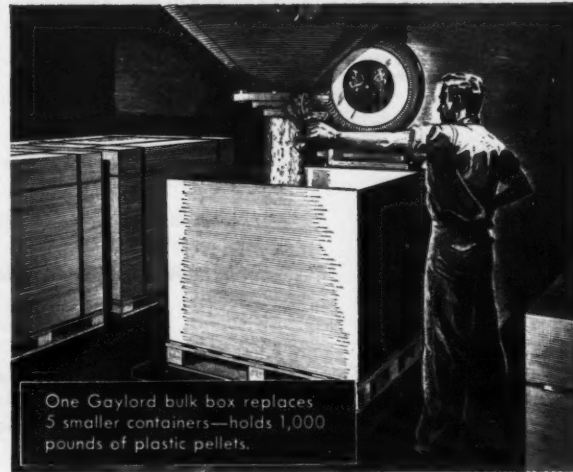
Here's a Gaylord "package" of six corrugated boxes—containing sets of controls for home laundry dryers.

... handling time costs cut 65% ...



This Gaylord corrugated bulk pack carries twenty 100-lb. slabs of wax.

... cuts manhours in weighing and loading ...



One Gaylord bulk box replaces 5 smaller containers—holds 1,000 pounds of plastic pellets.

... save space, save time in palletizing ...

## CUT COSTS WITH CORRUGATED BULK PACKS



From chemicals to component parts, Gaylord corrugated bulk packs and Drumpaks are saving money, time and handling for shippers. What's your line?

Call your nearby Gaylord packaging engineer.

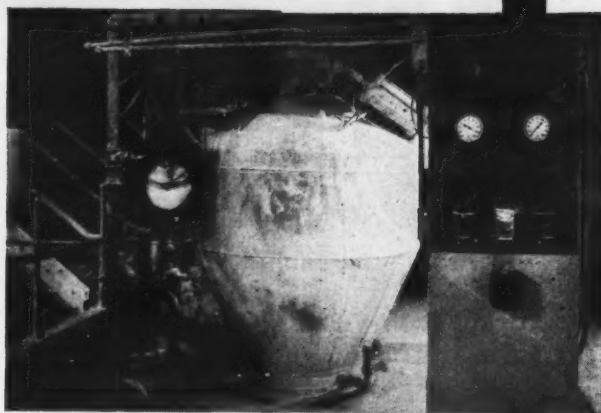
SEE OUR EXHIBIT AT THE 26TH EXPOSITION OF CHEMICAL INDUSTRIES. COLOSSEUM; NEW YORK, DEC. 2-8.

**GAYLORD CONTAINER CORPORATION • ST. LOUIS**

DIVISION OF CROWN ZELLERBACH CORPORATION

Check 2042 opposite last page.

## Difficult Bulk Handling Job



...but well-handled by the

**Robinson**

*Air Activated*

**Conveyor**

Product... abrasive chemical,  $\frac{1}{4}$ " to fine dust  
Temperature... 600° F.

**T**his Robinson Air-Activated Conveyor is installed in the plant of a well-known chemical company where it is conveying the hot chemical noted above... a job on which other means of handling, including pneumatic, either failed or proved inadequate.

Robinson operations can be made fully automatic and closely controlled by precise instrumentation.

The Robinson System—completely pneumatic, with gravity feed—offers several outstanding advantages for handling fine granular or dry powdered materials into, through and from the plant.

- 1... products are handled gently; the mixture is 'fluidized'; particles are floated rather than blasted through the conveyor.
- 2... only low volume of air is required; the average is less than 1 cubic foot of free air per pound of material conveyed.
- 3... maintenance costs are exceptionally low; no moving parts such as motors, screws, shafts and bearings to require maintenance.

The Robinson Air-Activated Conveyor may be just what you need for pneumatically handling the materials at your plant. Investigate its possibilities. We can point to many successful installations. Write us in detail about your problem.

**ROBINSON**

*Air Activated*

A Division of  
Morse Boulger Destructor Co.

**CONVEYOR SYSTEMS**

DEPARTMENT T, 80 FIFTH AVENUE • NEW YORK 11, N. Y.  
Representatives in Principal Cities

Check 2043 opposite last page.

## LATEST INDUSTRIAL TRUCK DEVELOPMENTS

... in design, capacity, operating features, and accessories for improved performance and safety



### Radical concept...

... in industrial lift trucks is unit that will lift 10 ft without a mast. This heavy-duty electric-driven truck has a lifting capacity ranging from 12,000 to 20,000 lb. By eliminating heavy mast assembly, manufacturer was able to save thousands of pounds from the overall weight. Greater visibility is another advantage because there are no uprights or rams to interfere with driver's vision. As proof of its excellent maneuverability, the truck operated easily through 78" boxcar door, and in 13' 8" right-angle aisle, during exhaustive tests. Two 16"-wide tires provide better load distribution and stability for truck's narrow overall width of 48". With only an 80" overall height, the 120" lift is the highest ratio between lift and overall height of any industrial truck of this capacity. "Elbolift" is product of Automatic Transportation Company, 149 W. 87th St., Chicago 20, Illinois.



Check 2044 opposite last page.

### Skid adapter...

... allows manufacturer's 24-volt electric walkie truck to handle both skids and pallets with loads up to 4000 lb. When the truck is moving pallets, the steel frame of the adapter



is locked in an upright position. To handle skids, the operator releases the lock, letting skid adapter swing down into position over forks. Available

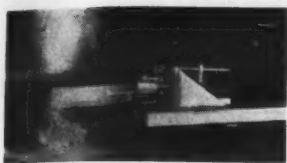
to handle skids of any standard underclearance, adapters can have same dimensions as forks which are offered in 24, 27, and 30" widths, and 30 to 60" lengths. Skid adapter is manufactured by The Raymond Corp., 57-153 Madison Ave., Green, N. Y.

Check 2045 opposite last page.

### Drum handling attachments...

... for lift trucks to handle individual drums, two drums horizontally or vertically, and two or three drums at a time, spotting one drum at a time, are now available. All eight devices are covered by Kugler patents, and do not require hydraulic system to operate. They may be used for inter-





mittent handling of drums because of the ease with which they can be slipped on or off the end of regular forks. Attachments can handle drums up to 55-gal. Vert-O-Matic drum handling attachments are product of Little Giant Products, Inc., 1530-50 N.E. Adams St., Peoria, Ill.

Check 2046 opposite last page.

#### LPG system . . .

... has been made available as optional power on manufacturer's line of fork-lift trucks. Interchangeable on all models, low maintenance equipment requires minimum space, and is installed so as not to interfere with any function of the fork truck. LPG system is available for products of Industrial Truck Div., Clark Equipment Co., Battle Creek, Mich.

Check 2047 opposite last page.

#### Extra lift . . .

... without increasing overall lowered height is feature of lift truck with roller-type mast. Diesel, gasoline, and LPG models are available in capacities to 10,000 lb. Easy shifting is provided by two-speed, constant-mesh transmission. Unit can operate in 86-inch intersecting aisle.

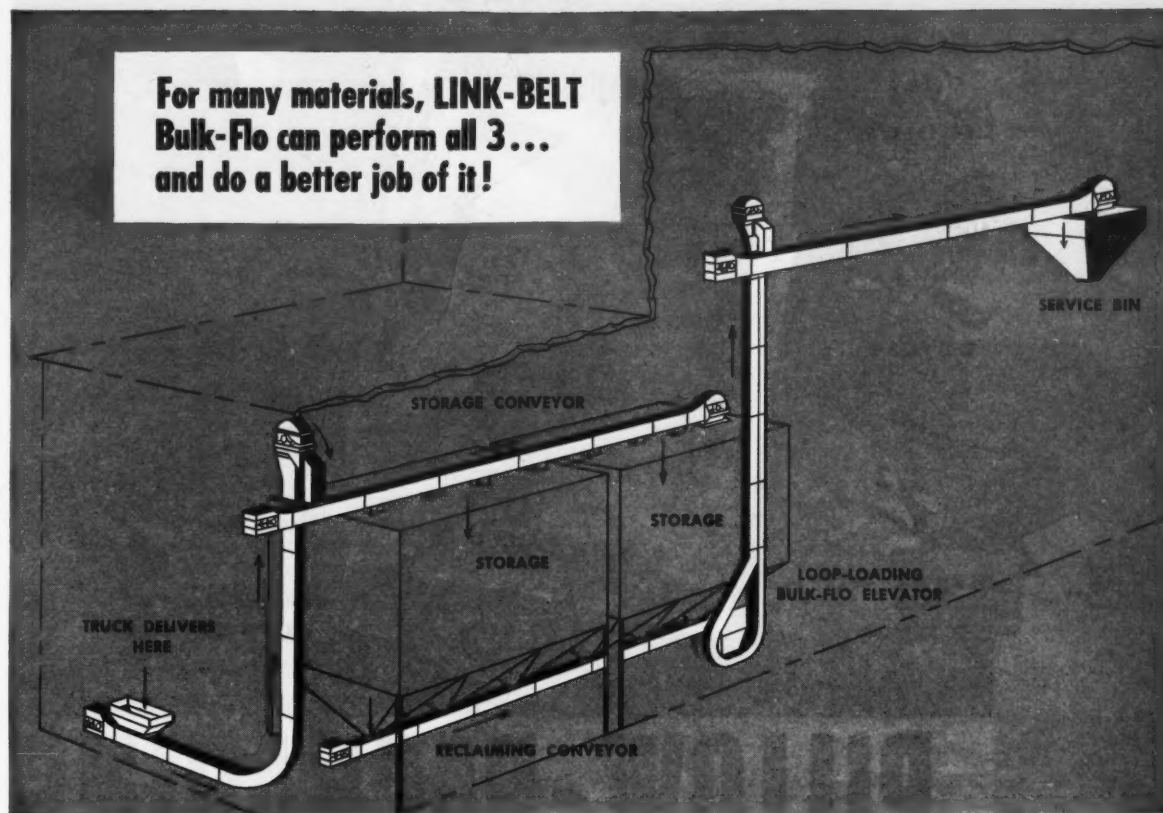
(Lift truck is manufactured by Tractor Group, Allis-Chalmers Co., Box 512, Milwaukee 1, Wis.)

Check 2048 opposite last page.



# Why buy separate conveyors, feeders, elevators?

**For many materials, LINK-BELT Bulk-Flo can perform all 3... and do a better job of it!**



**FIVE BULK-FLOS** form an efficient system for handling material from unloading to storage, and into processing at this plant. Material is dumped directly into hopper of L-type

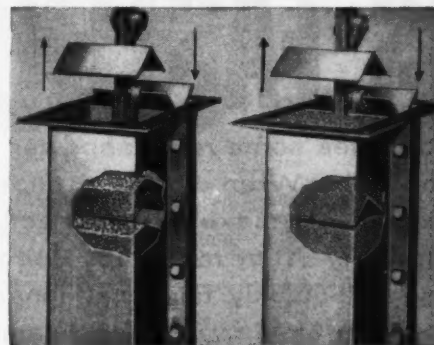
Bulk-Flo, with no separate feeder needed. Note flexibility of distributing and reclaiming units to discharge and reclaim material at many points. Capacity here is 30 tph.

**F**UNCTIONING as a conveyor, a feeder and an elevator—all in one compact, enclosed assembly—Link-Belt Bulk-Flo saves the space and expense of individual units. Initial cost is much lower—so are power requirements. And because Bulk-Flo's flights operate in a close-fitting casing, you get positive movement of materials even when it's

loaded to less than full capacity. Unlike other designs, feed can be varied to suit changing demands.

Bulk-Flo offers gentle handling as well. Material is carried and protected in individual "compartments"—degradation is minimized.

Your Link-Belt office or Book 2475 can quickly tell you how Bulk-Flo can fit into your plant.



**PARTIALLY OR FULLY LOADED**—Bulk-Flo assures positive, gentle movement of materials. Unit is self-clearing, minimizes contamination when handling different products.

## LINK-BELT

BULK-FLO FEEDERS • CONVEYORS • ELEVATORS

**LINK-BELT COMPANY:** Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 7; Canada, Scarborough (Toronto 13); Australia, Marrickville (Sydney), N.S.W.; South Africa, Springs. Representatives Throughout the World.

Check 2049 opposite last page.

DO IT AUTOMATICALLY WITH LYNCH

# ROBO-WRAP



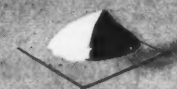
LIQUIDS



CANDY



MIXED NUTS



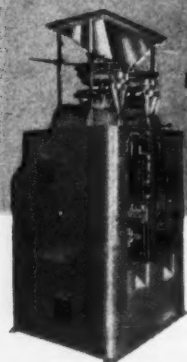
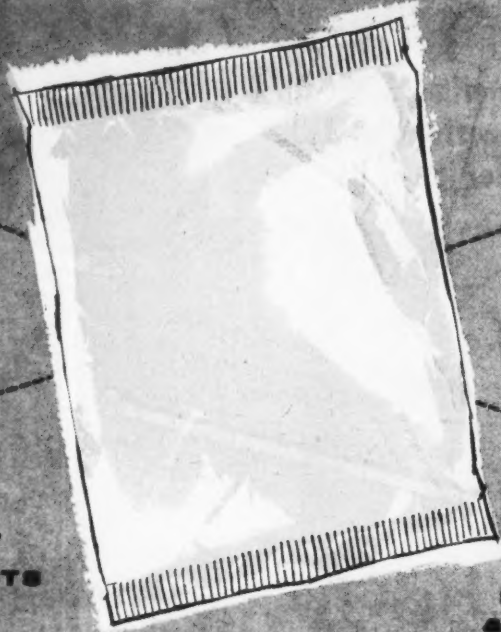
POWDERS



CRACKERS



HARDWARE  
& NOVELTIES



## PILLOW-PACKAGING IS FASTER...COSTS LESS!

You'll see some *real* manpower savings with Lynch ROBO-WRAP! One operator and Robo-Wrap can form, fill, and seal 60, 120, 240 pillow-packages a minute. Exclusive hand-over-hand action does the job faster than any other machine. Robo-Wrap changes package size quickly; takes cellophane, polyethylene, saran, plyafilm, mylar, foil and laminates; handles solids, liquids, powders, and granules easily; keeps them clean. New booklet gives full facts on low maintenance and simple integration with existing equipment. Write for it today.



Check 2050 opposite last page.

### MATERIAL HANDLING

#### Bag cutter saves time and labor

**Uses:** For cutting bagged refractories, cements, chemicals, etc.

**Features:** Bags can be opened in advance with this device, and stacked at job site for rapid, convenient use.



Ruggedly constructed bag cutter cleanly cuts paper sacks in half for ease of lifting and emptying

**Description:** Bag cutter can be used at floor level or raised to desired height on its legs of one-inch pipe. Blade is of hardened steel which is encased in steel sheath when not in use. Unit is ruggedly constructed.

(Bag cutter is product of Ridley and Co., 11275 Massachusetts Ave., Los Angeles 25, California.)

Check 2051 opposite last page.

#### Production weighing with lab accuracy

Accurate to 1 part in 10,000

**Uses:** For automatic check weighing.

**Features:** Unit provides laboratory accuracy in production weighing. It is accurate to 1 part in 10,000. The element of human error connected with laboratory scales has been eliminated.

**Description:** Heart of automatic checkweighing scale is flexure plate leverage system which functions without use of knife-edge pivots.

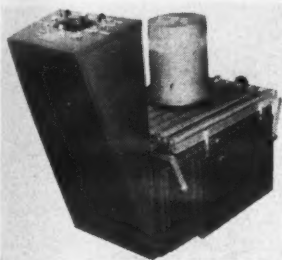
System has been proven over years. In many instances more than 15 million weighings have been made without



## MATERIAL HANDLING

any loss of accuracy or sensitivity.

Exact weight is indicated by direct reading register in decimal system either in pounds or grams, and scale may be used for classifying and segregating weight groups if desired.

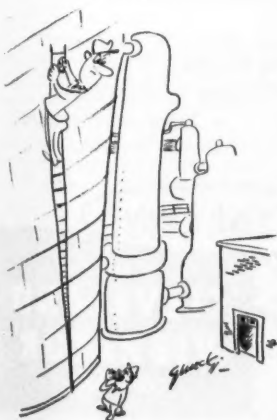


Checkweighing scale is accurate to 1 part in 10,000

Scale is available in various capacities and can be furnished with ticket printer, chart recorder, remote weight indicators, fully automatic conveyor system for complete automatic control, and other optional features. Platform sizes can be constructed to suit item to be weighed.

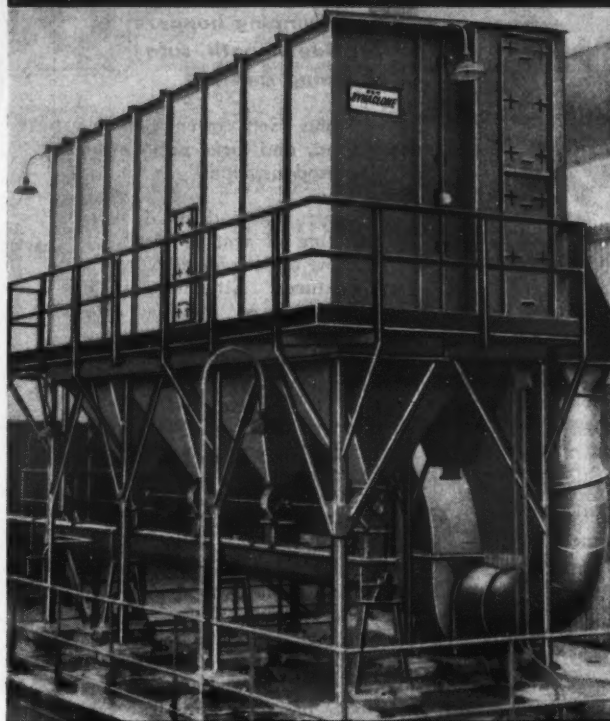
(Automatic checkweighing scale is product of Thayer Scale Corp., Thayer Park, Pembroke, Mass.)

Check 2052 opposite last page.



"Telephone!"

## Now... a New High in Dust Filter Efficiency...



# New SLY

## "ROLL-CLEAN"

### Dynaclone

Patent No. 2,582,557  
Process No. 2,582,558

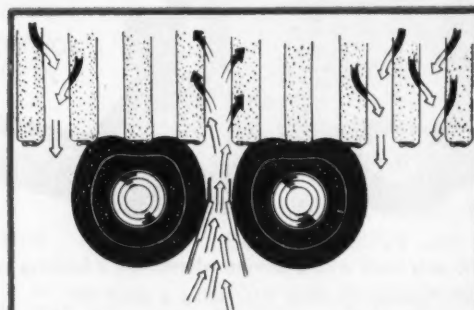
### THESE NEW FIELD-PROVEN FEATURES

- Easier filter bag changing.
- Greater cloth area.
- Fewer operating parts.
- Free-rolling cleaner — no sliding.
- Complete dust seal — automatic seal adjustment.
- Easy access to all dust filter parts for inspection and servicing.

### PLUS THESE TIME-TESTED DYNACLONE ADVANTAGES

- Constant suction at dust sources — complete dust collection.
- Self-cleaning for continuous operation.
- No auxiliary motors or blowers required for filter-bag cleaning.
- Greater filtering capacity and smaller space requirements — more cloth per cubic foot of filter than any other make.
- Lower power requirements.

The original self-cleaning dust filter, the Dynaclone has proven itself the most efficient dust filter ever made. The "Roll-Clean" Dynaclone combines design simplicity and rugged construction to insure even greater operating efficiency... even longer trouble-free service.



NEW "ROLLER CLEANER" provides greatly simplified method of cleaning dust from filter bags. Resilient rubber rolls automatically adjust to form a positive dust seal as each row of bags is cleaned by atmospheric air.

See it in Space 73, the Chemical Show,  
New York Coliseum, Dec. 2-6.

### NEW CATALOG

... gives full details on "Roll-Clean" Dynaclone and other SLY Dust Filters... contains valuable engineering information. Write for your copy.



## THE W. W. SLY MANUFACTURING CO.

4754 TRAIN AVENUE • CLEVELAND 1, OHIO  
OFFICES IN PRINCIPAL CITIES

Check 2053 opposite last page.



# MODERNIZE WITH America's most Modern Truck **Hydro~~Electric~~**

A GREAT NAME IN LIFT TRUCKS



*The exclusive Dyna-Dual Power  
Unit of the Hydroelectric*

**INCREASES**  
*the flow of materials*

**INCREASES**  
*productivity*

**INCREASES**  
*safety of operator*

**INCREASES**  
*profits*

**LOWERS**  
*labor costs*

**LOWERS**  
*maintenance costs*

**LOWERS**  
*production stoppages*

**LOWERS**  
*power costs*

The only truck with 2 driving wheels and 2 braking systems. In fact Hydroelectric does everything a good lift truck should do.

STUEBING Designed • Engineered • Built



**LIFT TRUCKS, INC.,** / CINCINNATI 14, OHIO



THERE IS A TRUCK FOR EVERY PURPOSE TO HANDLE ANY KIND OF MATERIAL.

Check 2054 opposite last page.

## MATERIAL HANDLING

**Self-dumping hoppers  
provide smooth, safe  
dumping service**

Rights self after dumping load, and locks positively in closed position

**Uses:** For industrial truck handling of wet or dry, cold or hot, bulk materials.

**Features:** Attached to lift trucks, hopper may be automatically dumped by releasing specially designed gravity, cam-latch at rear of hopper. After load is dumped, hopper rights itself and returns, locking positively and smoothly in closed position. Hopper cannot disengage until tripped by operator.

**Description:** Self-dumping hopper has all-electric welded construction of steel plate and structural steel. For storage of materials, or when not in use, hoppers are self-stacking and nesting, without special lugs or attachments. Five models are available with ½, ¾, 1, 1½, and 2 yard capacities. Lengths range from 49 to 74", widths from 40 to 52", and heights from 35 to 46".

(Self-dumping hopper is product of Apex Welding & Fabricating Corp., 30 Interstate St., Bedford, Ohio.)

Check 2055 opposite last page.

**Simplicity of installation,  
ease of maintenance,  
in electronic eye system**

Any position possible;  
all parts interchangeable

**Uses:** For automatic counting, sorting, controlling.

**Features:** Simple installation of system is obtained at any convenient point by using screwdriver and wrench. Parts can be replaced by removal of only one bolt. All units are interchangeable and can be replaced in a matter of minutes.

**Description:** Electronic eye system consists of two units: a projector (light source) and receiver (light sensitive control). Operating components of units are housed in spheres 5" in diameter.

# BIN STUCK LATELY?



It takes a full flow of sand to keep casting production at a high level. When sand chutes like these plug up, production ceases. The mold gets mad, you get mad and your customers get mad.

The installation of Cleveland Vibrators will keep everybody happy. By using Cleveland Vibrators on your bins, hoppers and chutes you eliminate bridging and plugging. Write for complete information and prices.

Air or Electric  
Portable or Permanent  
Silent or Standard



2706 Clinton Avenue • Cleveland 13, Ohio

Check 2056 opposite last page.

CHEMICAL PROCESSING

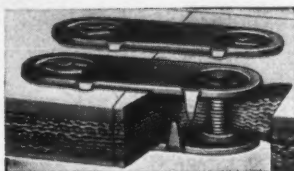
# FLEXCO

## BELT FASTENERS and RIP PLATES



FOR HEAVY  
CONVEYOR  
AND  
ELEVATOR  
BELTS OF  
ANY WIDTH

- ★ FLEXCO Fasteners make tight butt joints of great strength and durability.
- ★ Trough naturally, operate smoothly through take-up pulleys.
- ★ Distribute pull or tension uniformly.
- ★ Made of Steel, Monel, Stainless, Everdur. Also Promal top plates.
- ★ FLEXCO Rip Plates are for bridging soft spots and FLEXCO Fasteners for patching or joining clean straight rips.



Compression Grip distributes strain over whole plate area

Order From Your Supply House. Ask for Bulletin F-112

**FLEXIBLE STEEL LACING CO.,** 4649 Lexington St., Chicago 44, Ill.

Check 2057 opposite last page.



## THE IMPROVED PENNSYLVANIA "TAX CLIMATE"

*An Important Message for*

MANUFACTURERS • DISTRIBUTORS • INDUSTRIAL REALTORS  
MANAGEMENT AND ENGINEERING CONSULTANTS

Pennsylvania, this year, has taken major steps to create a "tax climate" favorable to new industry and expansion of established industries.

The 1957 Session of the General Assembly (the Commonwealth's legislature) which adjourned in June made the following basic tax changes:

1. Exempted manufacturers from the capital stock and franchise taxes;
2. Completed, state-wide, the elimination of machinery and equipment from local, ad valorem property taxation (there is no state-level general property tax in Pennsylvania);
3. Repealed the tax on stock transfers;
4. Made the temporary 3 per cent rate of the Pennsylvania Sales Tax permanent—now the principal source of Commonwealth revenues;
5. Reduced the sales tax on purchases made by manufacturing firms.

These changes, plus the absence of a state personal income tax, and the growing dependence of localities on non-property taxes, mean major "advantages", taxwise, to companies locating or expanding in Pennsylvania.



Get the whole story of Pennsylvania's new tax advantages. Send for booklet entitled "The Improved Pennsylvania Tax Climate"

Write to:

Pennsylvania Dept. of Commerce  
Main Capitol Building  
973 State Street,  
Harrisburg, Pennsylvania  
Telephone CEDar 4-2912.

Check 2058 opposite last page.

## MATERIAL HANDLING

System is completely self-contained. Receiver sphere houses light sensitive "eye," amplifier, and relay. Projector sphere contains lamp and transformer. All operating components in receiver sphere are assembled in top half, which is removable and plugs in to facilitate servicing and maintaining the system.

Leads to power line and to device being controlled are only wires on system. Spheres can be mounted directly on conduit which carries electrical leads. No other mounting devices, brackets, or external equipment are necessary.

Calibrated sensitivity control, adjustable from outside housing, provides for locating spheres close together or far apart. Easy-to-adjust lens focus system permits focusing light paths of both receiver and projector to allow small object to break light beam a few inches or a few feet away from lens.

Spheres have 1/4" standard female pipe thread. Power supply is 115 volt, 60 cycle; power consumption is 15 watts (receiver), 12 watts (light source).

(Electronic eye system is product of Basic Controls Co., 4350 S. Sepulveda Blvd., Culver City, California.)

Check 2059 opposite last page.

### FOR MORE INFORMATION

Here's what to do when you want additional details about products and services mentioned in this issue's editorial articles or advertisements.

Note the number at end of article or advertisement. Check this key number on Reader Service slip opposite last page of this issue. Fill in slip with the other pertinent information (name, title, company, address, product made). Mail to our Reader Service Department.

We'll contact the manufacturer for you. He'll send you the details direct.

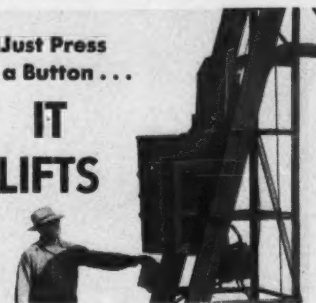
Here's a  
REAL  
LABOR  
SAVER!



## THE CESCO DUMPER

Just Press  
a Button...

IT  
LIFTS



...and DUMPS



Provides Easy, Safe Loading of  
BINS • BATCHERS • MIXERS

HANDLES DRUMS, BAGS,  
BULK, BARRELS and BOXES

Speed up materials handling with CESCO Skip-Hoist Dumpers. They lift, upend and dump up to 100 loads per hour, and have a capacity of up to 3000 lbs. Available in single or multi-purpose portable models in standard height from 4 to 15 feet. Stationary models to 20 feet.

Dumpers Engineered to Meet  
Special Applications.

Write for complete catalog

ESSEX CONVEYERS, INC.

165 Franklin Avenue, Nutley 10, N. J.

COLSON EQUIPMENT & SUPPLY CO.

1317 Willow Street, Los Angeles 13, California

**CESCO DUMPERS**

Check 2060 opposite last page.





The "Sure-Touch" Sheerness of  
**PIONEER** Liquidtight Gloves  
Speeds Intricate Assembly Work

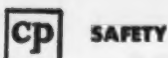


Style	Length	Material	Weight	Grip
Nimble Fingers V-10	10½"	Pylox Vinyl	Sheer	Non-Slip
Stanzoil RSW-13	10½"	Milled Neoprene	.018 (dbi)	Non-Slip
Sheergrip 0754	10½"	Natural Latex	.020 (dbi)	Smooth
Sheergrip 0794	10½"	Natural Latex	.025 (dbi)	Non-Slip
Sheergrip 0763	18"	Natural Latex	.023 (dbi)	Smooth
Sheergrip 4773	34"	Natural Latex	.035 (dbi)	Smooth
Sheergrip 7852	10½"	Neoprene Latex	.019 (dbi)	Smooth

**FREE Hand Protection Analysis**... Send a description of your job requirements (length, dexterity, wear resistance, chemicals used, importance of safe grip, hot or cold temperature extremes, fatigue factor and sizes) to our "Hand Protection Clinic." New catalog and price list available on request.

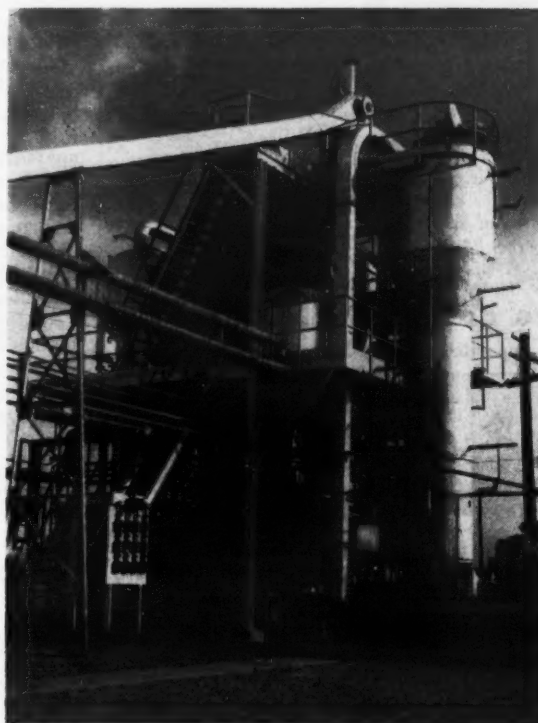
the **PIONEER** Rubber Company  
241 Tiffin Road, Willard, Ohio

Check 2061 opposite last page.



Realizing destructive potential of an uncontrolled fire in soybean solvent extraction facilities,  
Canadian Vegetable Oil Processing Co., Ltd . . .

## minimizes danger of hexane with foam and spray system



**Problem:** Solvent extraction of soy-bean oil utilizes hexane . . . presents a potentially dangerous fire and explosion hazard. Management at Canadian Vegetable Oil Processing Co., Limited, Hamilton, Ontario, realized that, in addition to danger to personnel and surrounding areas, an uncontrolled fire could destroy large quantities of valuable equipment.

Hexane has a flash point of -15°F and an ignition temperature of 500°F. Explosive limits are from 1.2 to 7.5% hexane vapor in air.

**Solution:** A combination of water spray and mechanical foam nozzles in a fire protection system was installed on hexane solvent extraction units. A total of 162 water spray and 24 foam heads were used. Sizes, positions, and number of heads were engineered to protect these specific structures.

Control is by rate-of-tem-

Hexane solvent extraction units at Canadian Vegetable Oil Processing Co., Limited. Potential fire damage is minimized by foam and water-spray system

Lower section and base are blanketed with foam which prevents formation of explosive mixtures



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pneumatic  
metal air  
proximate  
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## hexane fire system

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of-tem-

perature-rise detectors which actuate both water spray and foam nozzles if rise in temperature is more rapid than normally encountered because of changing atmospheric conditions. Detection is thermopneumatic. Pressure in hollow metal air chambers, located proximate to hazard, is transmitted to remotely located deluge valve. Normal changes in pressure are relieved by compensating vents. Rapid pressure build-up, resulting from high temperature of fire, causes a diaphragm to actuate system.

Mechanical foam, which protects lower portion of units, is formed by mixing a 3% solution of foam stabilizer with water and air. System discharges approximately 1200 gallons of foam per minute.

To next page

Water spray on upper portion of units cools equipment, washes down any escaped liquid hexane

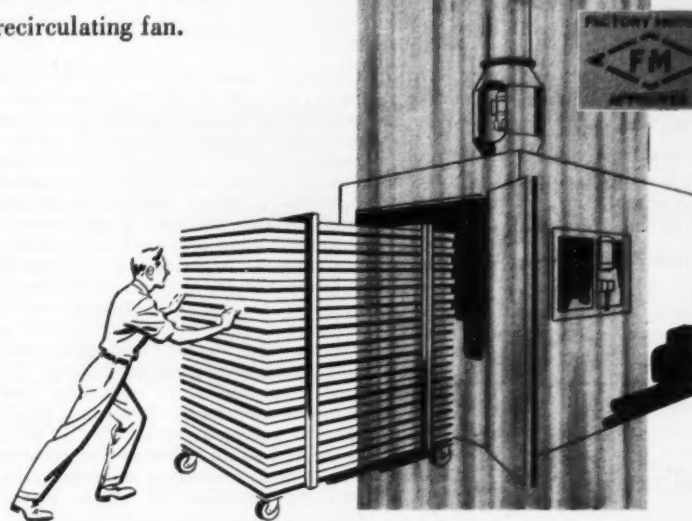


## REDUCE OVEN EXPLOSION HAZARD

### Bifurcator® fan exhausts work chamber vapors

Don't take a chance with *any* industrial oven. Install a Bifurcator fan to prevent vapors from accumulating in the work space and forming an explosive mixture. Remember, factory fire insurance companies say a positive fan is necessary to exhaust dangerous vapors, even though the oven may have a recirculating fan.

And here's important news:  
DeBothezat Fans are guaranteed to perform in accordance with their current published ratings — and this guarantee is backed by a \$250,000.00 performance bond on deposit with The New York Trust Company.



----- MAIL COUPON TODAY -----

**DeBOTHEZAT FANS DIVISION**  
**American Machine and Metals, Inc.**  
**Dept. CPD-1157, East Moline, Illinois**

Yes, send me catalog and full data on the Bifurcator fan for exhausting explosive or flammable vapors.

FIRM \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_

ZONE \_\_\_\_\_ STATE \_\_\_\_\_

ATTENTION MR. \_\_\_\_\_

**De Bothezat FANS**  
A DIVISION OF  
**American Machine and Metals, Inc.**  
EAST MOLINE, ILLINOIS

IN CANADA: Represented by DOUGLAS ENGINEERING CO., Ltd., Toronto • Montreal

## Fire Spray Systems

From preceding page

A 10 minute supply of foam compound is available for initial discharge with an additional 10 minutes reserve supply.

Upper portion of units is covered by water spray which cools equipment, and provides water vapor for dilution of flammable mixtures. It also washes down any escaped liquid hexane and oil to lower portion of installation where it can be blanketed by foam.

**Results:** Fire protection system provides positive protection against fire damage. System acts to keep spilled material from forming an explosive mixture during a fire and prevents pressure build-up inside equipment. Heat damage to auxiliary equipment such as chain drives, motors, pumps, and valves will be kept to a minimum. Regular inspection assures that condensed vapors or process material have not clogged nozzles and that all proper valves are open. No other maintenance is necessary.

(Fire protection system was supplied by Grinnell Company of Canada, Ltd., 2440 Dundas St. West, Toronto 9, Ontario.)

Check 2063 opposite last page.



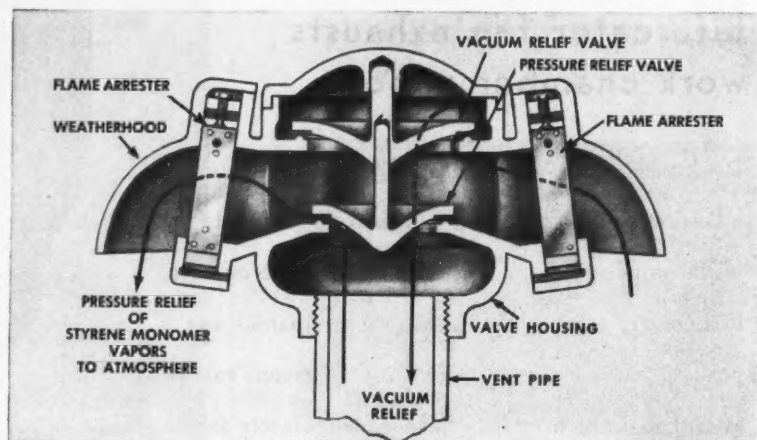
"... You see, there are safety directors, ... and then there are safety directors ..."



# FLAMMABLES ENGINEERING BY

FLAMMABLES CONTROL METHODS AND PRACTICES IN PRODUCTION, PROC

## Styrene monomer vapors controlled to reduce vent clog-up...prevent tank rupture

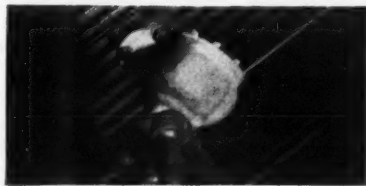


Chemical manufacturer stores styrene monomer in 30,000 gallon horizontal tanks at atmospheric pressures and temperatures. Plagued by polymerizing which clogs flame arrester vents ... flash point of 90°F requires protection against ignition of vapors from outside sources. Tried various means to keep arresters open without success ... installed Protectoseal conservation type vent with flame arrester located outside the valve housing ... arrester now subject to vapors only when valves open. Result: checked weekly during 11-month period ... including hot summer months ... report no plugging of valves or arresters ... tank protected against fire and explosion ... arrester location outside valve housing provides for quick, visual inspection.

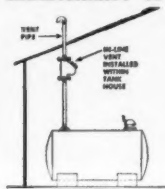
For Further Information  
Check Conservation Vent File No. 64 on Coupon

## Eliminates costly roof-top vent maintenance

Protectoseal in-line type flame arrester vents installed within tank



houses ... on chemical process tanks ... storage tanks ... bleed lines ... bleed tanks ... or other waste gas lines. Installed 20 to 50 feet from open end of vent pipe depending on vent sizes ... and it's approved. Prevents flash-backs through vent opening ... protects volatile liquid tank vapors against fire and explosion ... provides easy inspection and maintenance of flame arrester element ... arrester protected from outside atmospheric conditions and freezing ... no difficult, costly roof-top or upper wall inspection and maintenance.



For Further Information  
Check In-Line Vent File No. 65 on Coupon

## Now! Viscous liquids dispensed quickly—without waste

No more clinging slop-overs ... no more sticky rubber cement cans ... now—quick, clean, cut-off when dispensing. Spring actuated knife-edge closure operated by carrying handle cuts dispensing stream cleanly ... instantly ... upon release. No hardening by solvent evaporation ... no waste time ... no mess ... no time-consuming clean-up.

For Further Information  
Check Viscous Liquids Dispenser File No. 66 on Coupon

## Safety space-savings in chemicals handling



Oval shape, 1-gallon laboratory safety container requires far less shelf space for chemicals storage ... four cans easily placed in same area required by two or three ordinary cans. Protects volatile chemicals from fire and explosion ... provides easy method for storage and visual labeling.

For Further Information  
Check Laboratory Container File No. 67 on Coupon

## Static electricity—a hazard in flammable liquid dispensing



Generated in all volatile liquid dispensing processes ... found in many everyday operations. Best protection is grounding ... permits electricity to flow away ... stops sudden sparks and ignition of volatile vapors.

Protectoseal transfer pump hose for dispensing flammable liquids from drums has special metal wire insert running full length of hose ... forms static-free ground between pump and receiving container.

Quick shut-off, non-drip Protectoseal safety drum faucet with flexible metal hose also forms static-free ground with receiving container. Result: volatile vapors protected against ignition from static sparks.

For Further Information  
Check Drum Dispensing File No. 68 on Coupon

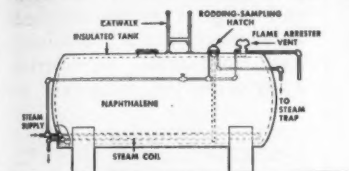


# BY PROTECTOSEAL

PROCESSING AND IN MAINTENANCE

## Fundamentals of steam heated tank venting

Steam heated storage tanks and safety venting equipment required for certain liquids... wherever crystallization of vapors occurs at normal temperatures. Important that tank safety venting equipment, flame arresters and other operating fittings be heated... kept free of clogging



action of crystallizing vapors to provide required pressure and vacuum relief... prevent rupture of tank. Rodding and sampling equipment must also be heated to permit satisfactory operating procedures.

Practical methods provide adequate insulation and proper heating by steam coils or pipes to temperatures often reaching as high as 178°F.

The diagram shows the theory of installing steam jacketed equipment on a horizontal tank containing Naphthalene.

For Further Information  
Check Fundamentals of Tank Venting File No. 69  
On Coupon

## Safe chemicals transfer to small mouth containers



Best accomplished with flexible metal spout... directs liquid flow accurately... safely... to small fill openings of receiving containers. No spillage... no waste... no excessive vapors. Flexible metal spout makes contact with metal receiving container... forms static-free ground... prevents ignition of volatile vapors from chance spark.

For Further Information  
Check Laboratory Dispensing File No. 70 On Coupon

## Loading-unloading volatile liquid tank cars—safely!

Liquid-tight dome cover saves time... eliminates chance of fire and explosion when distributing flammable liquids to or from railroad tank cars or tank trucks. No sparks when making or breaking loading pipe connections... pipe attached quickly... held securely... speeds loading-unloading time... with safety. Dome cover contains pressure-vacuum relief provisions... avoids creating a vacuum... prevents possible rupture of tanks while pumping.



For Further Information  
Check Tank Car, Tank Truck Cover File No. 71  
On Coupon



## AT YOUR SERVICE / specialized experience in FLAMMABLES ENGINEERING

Practical help in controlling flammable liquids used in production, processing and maintenance is readily available from Protectoseal Field Engineering Service without cost or obligation. Experienced field engineers who work constantly with flammable liquid uses and applications in many different industries have acquired a wealth of first-hand knowledge and experience which enable them to suggest practical ideas and adaptations for safe cost savings in storage, handling and use.

R. "Harp" Folkemer  
serving key industrial areas in  
Ohio, New York, Western Pennsylvania



### FLAMMABLES ENGINEERING DATA

also available on any of the following flammables hazards

Check the file number on coupon.

File No. 56—Leaky Drum Faucets

File No. 59—Clogged Paint Spray Guns

File No. 57—Disposal of Oil Soaked Cloths

File No. 62—Protecting Paint Brushes

File No. 58—Dispensing Solvents within the Plant

File No. 63—Cleaning Small, Delicate Parts



The Protectoseal Company  
1932 So. Western Avenue, Chicago 8, Illinois

☐ Please register my name for regular issues of Flammables Engineering Bulletins

☐ Send additional data on FILE NO's. 56, 57, 58, 59, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71

Name \_\_\_\_\_ Position \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

## Orlon uniforms resist acid by as much as 50 to 1 over other materials

Employees at Danbury Metal Finishing Company, Danbury Conn., are in constant contact with various acids such as sulfuric, muriatic, and nitric in electronic component plating operations. Company-supplied uniforms of 100% Orlon have proven their ability to withstand these highly corrosive conditions better than garments of other materials by as much as 50 to 1.

In normal use, a pair of 100% Orlon pants lasts about six months and a shirt wears



Acid-resistant uniforms prevent damage to employees clothing

for almost two years. Although the garments are eventually discarded due to wear and abrasion, none have had acid holes in them. Worn remnants are salvaged by converting them into useful aprons when they are turned in for new uniforms.

(Orlon uniforms manufactured by Worklon, Inc., 253 W. 28th St., New York 1, N. Y.)

Check 2065 opposite last page.

## Shut-off valves

Bulletin of 12 pages illustrates and describes manufacturer's line of safety shut-off valves. Capacity tables for both low and high pressure gas, and for oil, are presented. Bul 22—The North American Manufacturing Co., 4455 E. 71st St., Cleveland 5, Ohio.

Check 2066 opposite last page.



don't wait for a  
**SERIOUS  
ACCIDENT**

Install a  
**"NECO"  
SAFETY  
TANK CAR PLATFORM**



Model NECO-2A  
is outfitted with  
lights, access ladder,  
incorporates piping.

Eliminate dangerous hazards of working on slippery tank car tops. Avoid costly, heartbreaking accidents. Protect your employees — make them more efficient.

Custom built vertically adjustable platforms available in a range of prices. Hydraulically or manually operated. Write for pictures, specifications, information.

**N**

**NICHOLS ENGINEERING CO.**

3816 W. GRAND AVE. CHICAGO 51, ILL.  
SERVING INDUSTRY SINCE 1894



Check 2067 opposite last page.



## Special U-Type Safety GRATING

Now Available—Dravo safety U-type grating is designed particularly for use in critical areas where minimum openings are required. Openings of only  $\frac{5}{16}$ " x  $1\frac{1}{8}$ ". Bearing bars are  $\frac{1}{16}$ " apart, with cross bars on 2" centers.

For information, write Dravo Corporation, Dept. D-2711, Pittsburgh 22, Pa.

**DRAVO  
CORPORATION**

Check 2068 opposite last page.

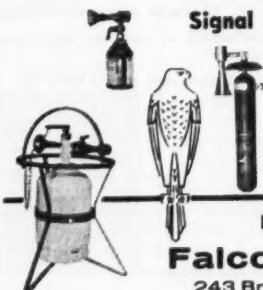
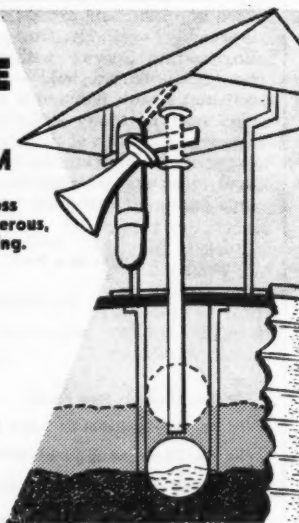
## AVOID SPILLAGE

### with FALCON TANK-LEVEL ALARM

Automatic warning prevents loss of product through often dangerous, always expensive tank overfilling.

- NON-ELECTRIC
- NON-PNEUMATIC
- SELF CONTAINED
- INEXPENSIVE

Float activates CO<sub>2</sub>-powered horn at predetermined level, instantly sounds alarm.



### Signal Horns by Falcon

Portable Falcon signalers ideal for 1,001 industrial applications. Round-the-clock fire protection with U/L approved automatic Falcon fire detectors. Self contained, inexpensive, minimum maintenance.

Representatives in principal cities.

**Falcon Alarm Co., Inc.**

243 Broad St., Summit, New Jersey  
Check 2069 opposite last page.

## SAFETY

### Quickly pin-points location of dangerous openings in pipe lines

Red bands point out danger points

**Uses:** For providing safe, positive, and convenient method of gaining access to threaded port of pipe or valve.

**Features:** Brilliant red bands quickly pin-point locations of dangerous openings in pipe lines prior to reinsertion of plug after line has been cleaned or drained.

**Description:** Bull plug has permanently attached chain and ring at unthreaded end preventing it from becoming lost, misplaced, or carried away from job. Ring may be



Danger signal bull plug gives immediate warning that unsafe conditions exist

used to circle valve or pipe, or chain may be spot welded to line. Long shank of plug permits easy removal and replacement. Plug is available in steel and stainless steel for pipe ranging in sizes from  $\frac{1}{4}$  to 2".

(Danger Signal Bull Plug is Product of Crawford Fitting Co., 884 E. 140th St., Cleveland 10, Ohio.)

Check 2070 opposite last page.

### Compact, portable unit detects accumulations of explosive gases

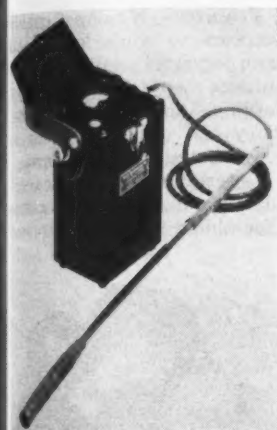
**Uses:** For detecting concentrations of explosive gases.

**Features:** Instrument is housed in compact, weather-proof, rustproof metal case.

**Description:** Portable, explosive gas detector operates on two-volt storage battery. Battery charger is provided

## SAFETY

with each unit. Operation of detector is controlled at instrument panel. It is factory calibrated for methane and ethane gases, but may be obtained with calibrations for other gases. Concentrations of gas, below lower explosive



Improved, portable measuring instrument determines accumulations of explosive gases

limit of gaseous atmosphere in which instrument's probe is placed, are registered on direct reading explosive meter. Actual percentages for specific gases are shown by calibration curves.

(Probetector Model 504 is product of Atlas Laboratories, Inc., Houston, Texas.)

Check 2071 opposite last page.

### FOR MORE INFORMATION

Here's what to do when you want additional details about products and services mentioned in this issue's editorial articles or advertisements.

Note the number at end of article or advertisement. Check this key number on Reader Service slip opposite last page of this issue. Fill in slip with the other pertinent information (name, title, company, address, product made). Mail to our Reader Service Department.

We'll contact the manufacturer for you. He'll send you the details direct.



Loren Farris  
PERSONNEL DIRECTOR  
Detroit Division  
Chicago Rawhide Manufacturing Co.

Chicago Rawhide Manufacturing Co.



*"Look! It soaks up grease just like a sponge."*

**L**AN-O-KLEEN removes 95% of all dirt and grime encountered in industry.

Easily — and safely!

**L**AN-O-KLEEN helps to protect the skin as it cleans. WEST — in pioneering the development of "double action" industrial cleaners — was the first to impregnate beneficial amounts of free lanolin into a corn meal type hand cleaner.

**L**AN-O-KLEEN is economical to use. It bulks greater than most other hand cleaners — therefore goes farther per pound. Too, the sturdy LAN-O-KLEEN dispenser rations just the right amount to do a quick, thorough cleansing job.

## "We know of no safer hand cleaner than Lan-O-Kleen"

"We've always been interested in preventing dermatitis. This is why we've supplied our plant employees with Lan-O-Kleen for the past ten years. Its free lanolin and soft cleansing action help prevent skin irritations, yet quickly remove dirt, grease and grime," says LOREN FARRIS, Personnel Director, Detroit Division of Chicago Rawhide Manufacturing Company.

"Several of our departments have also used West Antiseptic Protective Hand Creams for a number of years. We know these aids to comfort and safety help keep our workers on the job at maximum efficiency."

Would similar results interest you? Send the coupon.

LARGEST COMPANY OF ITS KIND IN THE WORLD



WEST DISINFECTING COMPANY, 42-16 West Street, Long Island City 1, N. Y.  
Branches in principal cities • In Canada: 5621-23 Casgrain Avenue, Montreal

- ☐ Please send your 24 page booklet "The Control of Dermatitis in Industry."
- ☐ Please have a West representative telephone for an appointment.

Name.....

Position.....

Mail this coupon with your letterhead to Dept. 24



Check 2072 opposite last page.

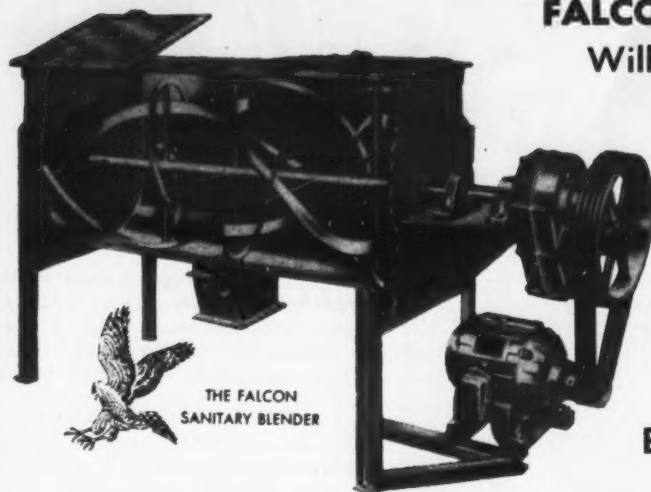


# The FALCON MANUFACTURING DIVISION

The COMPLETE LINE of NEW  
FALCON EQUIPMENT  
Will Be Exhibited

at the  
26th  
ANNUAL  
CHEM-SHOW  
Dec. 2nd to 6th  
New York  
COLISEUM

Booths 1174-1176



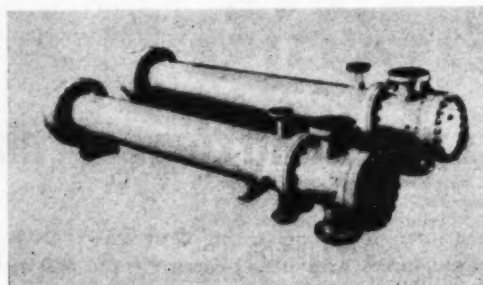
THE FALCON  
SANITARY BLENDER

The NEW SANITARY ADVANCED DESIGN FALCON BLENDER is engineered for fast efficient blending of powders, granulars, crystals, pastes or semi-liquids.

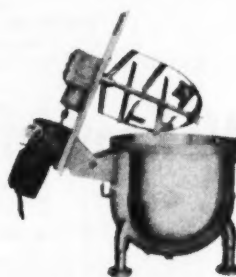
It is approved sanitary by Municipal Authorities. It is leak proof and dust-tite with a special plug type discharge. All joints are smooth welded, all surfaces are smooth, no projections, bolts or screws to hold previously mixed material. Ribbon assembly quickly and easily removed for cleaning. Made in all sizes . . . Stainless or Mild Steel.



STAINLESS TANKS  
AGITATORS



HEAT EXCHANGERS — CONDENSERS  
IN ALL METALS



STAINLESS KETTLES  
With or without Agitators



SPECIAL EQUIPMENT FABRICATED to your SPECIFICATIONS

The FALCON MANUFACTURING DIVISION  
of the FIRST MACHINERY CORP.

211 TENTH STREET, BROOKLYN 15, N. Y.

STerling 8-4672

Parking on our Premises

Cable "EFFEMCY"

Check 2073 opposite last page.

## SAFETY

Aluminized materials  
give more protection  
against radiant heat

Helmet cover-plate, face-  
shield window reflect more

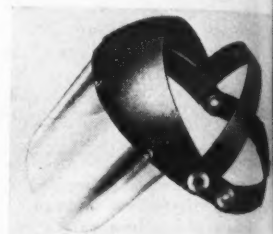
Uses: For protection against  
radiant heat.

Features: Windows enable  
workers to work longer and  
with greater efficiency in  
furnace operations, melting,  
forging, and metal pouring.  
They last over four times as  
long as untreated windows.

Description: Plastic cover-  
plate and cellulose acetate  
face-shield window are treated



Heavy Duty REACTORS fabricated to your  
specifications with dimpled or standard  
jackets; all types of agitators and dryers;  
Let FMC quote you on your needs.



Aluminized windows permit long-  
er working period, with greater  
efficiency, in heat operation

with an evaporated aluminized  
coating which reflects more  
than 70 percent of radiant heat  
normally reaching the worker's  
face. Windows are available  
for all A-O face shields of  
"H" series, and on other types  
by special order. Aluminized  
cover-plates are 2x4 1/4" size.

(Aluminized plastic cover-  
plate and cellulose acetate  
face-shield window are avail-  
able from Safety Products  
Div., American Optical Co.,  
Southbridge, Mass.)

Check 2074 opposite last page

## Cost saving hints

How industries can save space,  
time, and money by using  
manufacturer's asbestos papers  
to protect against fire, heat,  
corrosion is described in de-  
tail in four-page bulletin.  
Chart lists physical properties.  
Bul EL-92A — Johns-Manville  
Sales Corp., 22 E. 40th St.,  
New York 16, N.Y.

Check 2075 opposite last page

Lightweight  
provide g  
At over m

Uses: F  
from injur

Features:  
form-fits  
most presc  
even high  
temples.

Description:  
bridge of f  
protection  
comes in  
opaque b  
shatter-pro  
place by "C  
screen, or  
tion is ava



Safety goggles  
presc

(Model 440  
product of  
tical Co., I  
W. Exchan  
3, Rhode Is  
Check 2076



"I'm tel  
stuff real

Thanks to Ken  
der Co., Holy



## SAFETY

**Lightweight safety goggles provide greater comfort, fit over most glasses**

**Uses:** For protecting eyes from injury.

**Features:** Soft vinyl frame form-fits any face and over most prescription glasses with even higher than average temples.

**Description:** Flanged nose bridge of goggles gives added protection around nose. Frame comes in clear, green, or opaque black vinyl. Safe, shatter-proof lens is locked in place by "lock bar." Regular, screen, or fog-free ventilation is available.



Safety goggles fit over most prescription glasses

(Model 440M goggles are product of Watchmocket Optical Co., Inc., Dept. CP, 232 W. Exchange St., Providence 3, Rhode Island.)

Check 2076 opposite last page.



"I'm telling you, this stuff really cured my ulcers!"

Thanks to Ken Boyea, Hercules Powder Co., Holyoke, Mass.

## Chemically inert fittings, too



Made with standard 125# and 150# ASA housings (short radius), these 45° and 90° elbows can be installed in all standard flange piping systems.

Fluoroflex-T lining extends over the full gasket face of flange thus providing chemically inert, one-piece continuous barrier against all corrosive fluids.

Fluoroflex-T type S pipe and fittings are available in 1", 1½", 2", 3", 4" and 6" sizes.

### FLUOROFLEX-T IS TEFLON AT ITS BEST

It's a known fact that properties of Teflon can be changed manifold by deliberate or accidental minor variations of processing methods. The fabricator's experience, therefore, is the user's best assurance of quality and performance.

VISIT OUR BOOTH 889-891  
AT N. Y. CHEMICAL SHOW.

Originators of high temperature  
fluorocarbon hose assemblies

## AT LAST...



## universally corrosion-PROOF piping ... with strength of steel

Here is a chemically inert piping system that now means substantial savings for plants where severe corrosion is a costly downtime problem . . . and thermal shock an ever-present hazard.

### NO CORROSION - EVEN AT HIGH TEMPERATURE AND PRESSURE

Lined with a patented high density compound of Teflon, Fluoroflex-T type S Pipe can handle virtually every known corrosive substance to 500°F. It will not contaminate the fluids handled.

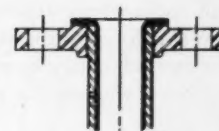
The Fluoroflex-T liner is formed over the full gasket face of the flange, eliminating troublesome joints with built-in protection and sealing that requires no extra gasket. It is housed within schedule 40 seamless steel pipe with 150# ASA flanges. 300# ASA flanges also available.

**ACTUAL SERVICE REPORTS:** Replacing glass lined steel pipe for handling 20% hydrochloric acid at 248°F and 20 psi, pipe lined with Teflon resin was still in use 34 months later.

Lined pipe replaced silver lined pipe for handling acidic stream of boron trifluoride hydrochloric acid and organic acid at 347°F, 18 psi . . . was unchanged after 5 months.

Write for data and nearest distributor.

© Fluoroflex-T is a Resistoflex trademark, reg. U.S. © Teflon is a DuPont trademark.



Fluoroflex-T completely covers full gasket face of flange . . . making integral gasket and liner absolutely immune to:

- All acids including hydrofluoric, hydrochloric, sulphuric, aqua regia
- all caustics
- all chlorides inorganic and organic
- all sulphates
- all solvents
- all phenols
- all bleaching solutions
- all peroxides

all hot . . . and at all concentrations

# Resistoflex

CORPORATION

Roseland, New Jersey • Western Plant: Burbank, Calif. • Southwestern Plant: Dallas, Tex.

Check 2077 opposite last page.

# as seamless as her best hose...

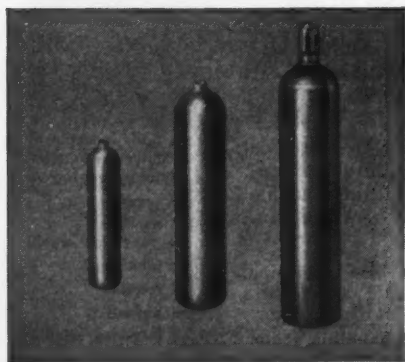
**Super smooth and  
lightweight, Hackney cylinders  
cut handling costs**

Hackney's special Deep Drawing process eliminates unnecessary cylinder weight and smooths cylinder surfaces.

That's why these versatile cylinders are used to ship and store many compressed gases at greater savings. Designed for compact neatness and built strong, Hackney cylinders are precision-controlled to meet your specifications.

See how many Hackney cylinders are used in today's industries—for medicinal gases, for flame cutting systems, for power actuators in the automotive and aviation fields, for mining inhalators, for fire extinguishers—in fact, wherever safety, dependability and economy are needed in a cylinder.

Write for specification sheets and see how Hackney seamless cylinders can boost efficiency in your operation.



Besides seamless cylinders, Hackney also produces a complete line of larger two-piece cylinders—all easy to handle, with low tare weight to save shipping dollars.

**Pressed Steel Tank Company**

*Manufacturer of Hackney Products*

1463 South 66th Street, Milwaukee 14, Wisconsin

Branch offices in principal cities

CONTAINERS AND PRESSURE VESSELS FOR GASES, LIQUIDS AND SOLIDS



Check 2078 opposite last page.



PACKAGING and SHIPPING



Union Carbide dressed up their 'Crag' brand Glyodin drum. Result: a package design award, and proof that . . .

## a drum can be a salesman

**Problem:** Paper labels on Union Carbide Chemicals' "Crag" brand Glyodin drum tended to fade, tear or come off. Label instructions are most important to proper application of Glyodin, a fungicide used on fruit trees.

Because of this, the Agricultural Chemicals Sales Department, decided they needed a new label that would have longer life under adverse storage and handling conditions and would, through greater eye appeal, do a better job of selling.

**Solution:** It was decided that

Glyodin, a quality product, should be sold in a quality package. As a result, Carbide chose to design an attractive permanent label that could be lithographed right on the drum itself.

At first it appeared that such labels could cost considerably more than paper labels. Coordination and teamwork by Production, Sales, and Advertising Departments made it possible to overcome many of the obstacles that initially indicated a lithograph label would be economically impractical.

"Package

It was d  
graphing d  
increase in  
more econ  
and effecti  
around labe

Rough lay  
prepared. F  
outside des  
Neubauer,

to prepare  
Neubauer c  
that had a  
poster effec  
for lithogra

Resulting  
both functi  
Brand name  
use", weigh  
formation, v  
statements,  
icity, and  
information  
into the d  
and cherrie  
Glyodin is  
design.

Combinat  
traditionally

CHEMICAL PROCESSING

NOVEMBER



"Packages that sell themselves" aptly describes lithographed drums coming off Carbide's Glyodin filling line

It was decided that lithographing drums, at a slight increase in cost, would be more economical, permanent and effective than wrap-around labels, stencils, etc.

Rough layouts of labels were prepared. Following this, an outside designer, Robert G. Neubauer, was commissioned to prepare the new label. Mr. Neubauer developed a design that had a sales-stimulating poster effect and was suitable for lithographing.

Resulting four-color label is both functional and attractive. Brand name, "instructions for use", weight and capacity information, warning or caution statements, flammability, toxicity, and chemical contents information were all woven into the design. Red apples and cherries — crops on which Glyodin is used — set off the design.

Combination of green — traditionally the color used to

identify Carbide's Agricultural Chemical line — and white with the red was felt to be the most effective from a display standpoint.

**Results:** Early in 1957, the drum won a certificate of merit in the Third Annual American Package Design Competition, sponsored by the Package Designers Council, National Organization of Professional Package Designers.

This award bears out the fact that Carbide achieved its objective — a permanent label that remains attractive and, at the same time, will do a good job of selling. Equally important is the fact that growers are receiving drums with all pertinent information intact in spite of all sorts of weather and handling conditions.

(Rheemcote® lithographed drums are manufactured by Rheem Manufacturing Co., 400 Park Ave., New York, New York.)

Check 2079 opposite last page.

## PROTECTIVE'S

DRUM LINERS • BAGS • CARTON LINERS

... all styles, all sizes, produced with fine materials: Polyethylene, Vinyl, Laminates and other flexible films — all at surprisingly LOW PRICES!



\*Double-Seal Guaranteed Safety ...

## SUCCESS!

"TWIN-SURE" DOUBLE-SEAL

straight bottom liners

"POWER-SEAL" round bottom liners

... originated and manufactured by the pioneers in plastic-liners for steel drums, fibre containers, cartons and boxes ... successfully tested and proven satisfactory for protective packaging by many of America's leading manufacturers, processors and laboratories.



... here are just a few users of protective liners:

Allied Chemical & Dye Corp.	McKesson & Robbins, Inc.
The Borden Company	National Lead Company
Breakdown National Laboratories	Chas. Pfizer & Co., Inc.
C-O-TWO Fire Equipment Company	Swift & Company
E. I. duPont de Nemours & Co.	Union Carbide & Carbon Corp.
Endicott Johnson Corp.	U. S. Quartermaster Corps
General Electric Company	

Guaranteed Satisfaction • Free Consultation • Free Samples Write Dept. CP-117

## PROTECTIVE LINING CORPORATION

GENERAL OFFICES AND PLANT: 22 WOODHULL STREET, BROOKLYN 31, NEW YORK

©TM

Check 2080 opposite last page.

## EFFECTIVE, ALL-DIRECTIONAL

# VIBROLATION

**MOVES GRANULAR  
OR WET MATERIAL  
NOISELESSLY**

The simplest, most quiet answer for moving materials in hoppers, chutes and bins. One moving part, no lubrication, no maintenance, never harms the equipment on which it is mounted. Instantly self-starting every time. Vibrolator is the only vibrator that can guarantee this regardless of operating conditions. Write for catalog. You will also receive form for describing your problem. No obligation!

Visit us at our booth No. 1118



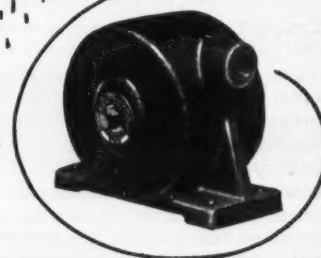
**ENGINEERING COMPANY**

155 KEMP ST. NEPONSET, ILL.

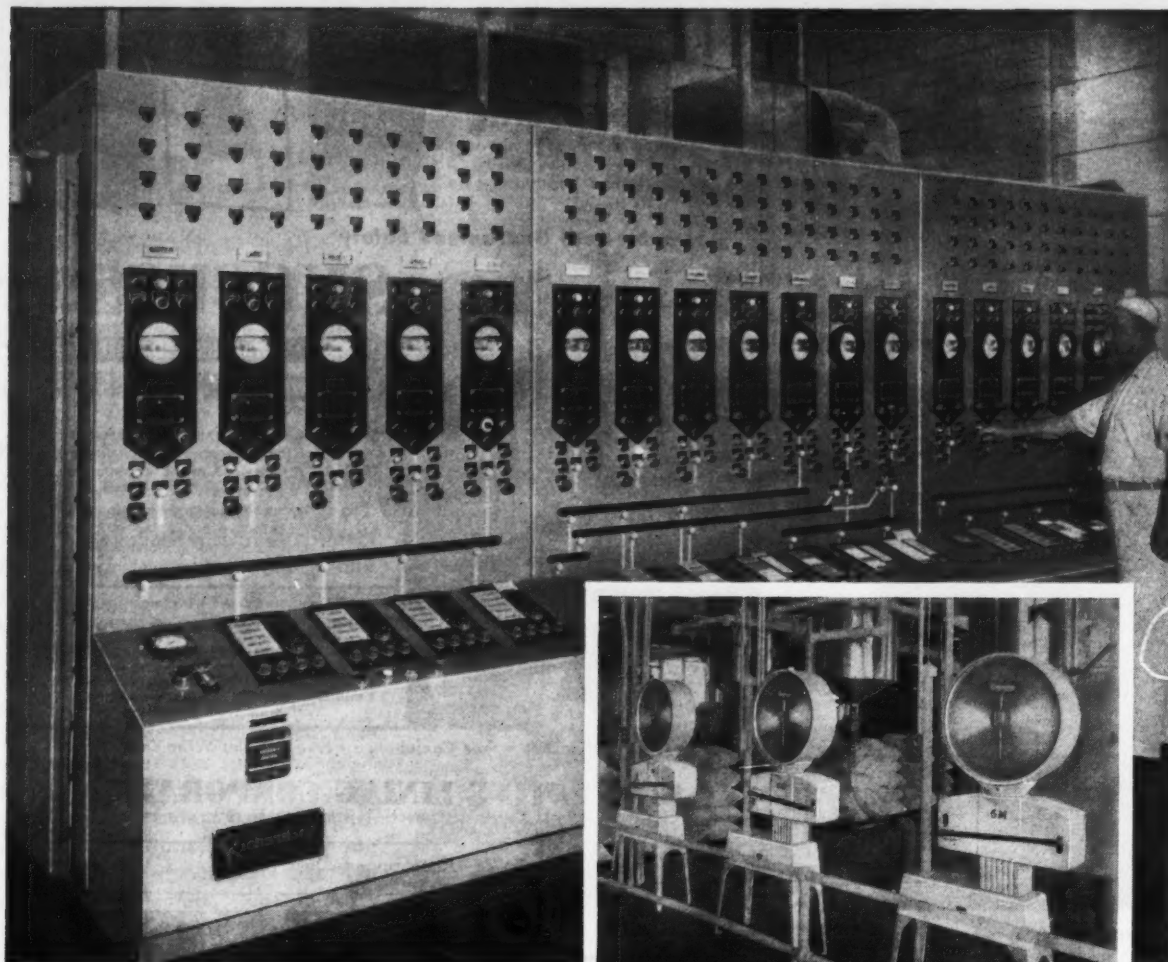
Check 2081 opposite last page.

### VIBROLATORS®

©Vibrolator is a registered trade name and applies only to the patented Peterson Vibrolator.







## BIGGEST PROPORTIONING PANEL IN FOOD INDUSTRY ...And Adaptable to Any Industry Requiring Precise Formulation

This Richardson Select-O-Weigh system is the most complete automatic proportioning panel yet installed in the food industry.

Coupled with a conveying system, the panel controls automatic feeding of material from any of 14 flour bins, two sugar bins, and storage tanks for shortening, invert, molasses, and water. With this system, the bakery can proportion three different formulas simultaneously. Every phase of operation is clearly indicated on the panel by means of signal lights, which graphically reflect

actual material flow. Ingredients can be delivered in the sequence and proportions called for by a specified formula. When each phase of this operation is completed, a signal light on the panel notifies the operator. When an ingredient is delivered to the mixer, a light beside the panel card on the board flashes. The operator knows at all times the progress of each formula being delivered to the mixers.

### CONTROLS

The entire Richardson Select-O-Weigh system is interlocked with all

elements it controls, so that any operation can be halted if necessary. At the beginning of each weighing cycle a "ready-start" light flashes, indicating the scale is at tare. At the conclusion of each weighing, an automatic weight check is made. Under or overweight is indicated on the control panel and scale discharge is automatically held up for correction.

For additional information on this interesting installation, and engineering assistance in automating your operation, write Richardson Scale Company, Clifton, New Jersey.

Ⓔ 4974

**Richardson**  
MATERIALS HANDLING BY WEIGHT SINCE 1903

RICHARDSON SCALE COMPANY, CLIFTON, NEW JERSEY  
Atlanta • Boston • Buffalo • Chicago • Cincinnati • Houston • Memphis • Minneapolis  
New York • Omaha • Philadelphia • Pittsburgh • San Francisco • Wichita • Montreal  
Toronto • Havana • Mexico City • San Juan • Geneva, Switzerland • Nottingham, England

Check 2082 opposite last page.

## PACKAGING

### Protect light-sensitive chemicals in these polyethylene bottles

Uses: Originally designed for photographic chemical solutions and powders, bottles can be used for any light-sensitive chemical compatible with polyethylene.



Amber polyethylene bottles give contents protection from light

Features: Amber color of polyethylene bottle is sufficiently dark to assure complete light protection and still allow the user to ascertain level of contents.

Description: Five sizes are available — 8, 16, 24, 32 or 48 and 1 gal. Caps provide airtight, light-tight seals.

(Amber polyethylene bottles are manufactured by Clayton Chemical Co., a division of American Photocopy Equipment Co., 5420 N. Damen Ave., Chicago 25, Ill.)

Check 2083 opposite last page.

### Fills 5-gal containers, 4 to 10 at a time

Semi-automatic machine has vacuum or gravity feed

Uses: Designed specifically for 5-gal containers, filling machine handles liquids, including foamy products such as detergents and waxes.

Features: Semi-automatic machine is available with four to ten spouts and choice of vacuum or gravity feed. Containers with offset openings are handled through special guiding arrangements.

Description: Containers are fed in on double-strand stainless-steel chain conveyor with

## PACKAGING

adjustable side rails. They come to definite stop in front of filling station which centers each container under filling head. Filling spouts are air-operated. When desired fill is accomplished, filling spouts are raised by air pressure.

Parts of machine in contact with material are stainless steel but can be supplied in other metal or plastic.

5-gal filling machine is manufactured by MRM Company, Inc., Dept. CP, 191 Berry St., Brooklyn 11, N.Y.)

Check 2084 opposite last page.

### Reviews aerosol history

Manufacturer offers informational brochure which reviews history and growth of aerosols, surveys market and product field, outlines facilities and services, and provides listing of contract fillers, valve manufacturers, and other aerosol industry suppliers. "Aerosols" — Dept. A, Continental Can Co., 100 East 42nd St., New York 17, New York.

Check 2085 opposite last page.

### Nylon batting gives good insulation, protection to package contents

Alkali-, fungus-, mildew resistant

**Uses:** To maintain constant temperatures and guard against damage to package's contents while in transit.

**Features:** Batting made of nylon fibers is anti-fungus, anti-mildew, rapid drying, and



Batting possesses all properties of nylon plus added tensile strength and high resilience

**Vulcan** delivers steel pails faster, SAVES YOU SPACE AND MONEY!

This is a true case history of all the companies who use Vulcan steel shipping containers. Their composite story reads like this: delivery of pails forced them to tie-up excessive funds and space in a big inventory. They switched to Vulcan, and got faster delivery, in all quantities, on a precise and rigidly maintained schedule. Their inventory needs dwindled rapidly, and they had more free cash and manufacturing space. The same thing can happen to you, because Vulcan is an expert authority engaged exclusively in the manufacture of steel pails and drums, and maintains the largest warehouse stock of these items. This means we can deliver your needs and inventory savings at the same time. May we prove it to you?

**NOW! REDUCE STEEL CONTAINER INVENTORY COSTS! MAIL THE COUPON TODAY FOR TEST SAMPLES AND THE NAME OF YOUR VULCAN REPRESENTATIVE!**

Hi-Bake protective linings • one to 55 gallon capacities all variations of open or closed heads • faster delivery from the largest warehouse stock • from a carton to a carload • brand name decoration • special designs



**VULCAN**  
CONTAINERS INC.  
Bellwood,  
Illinois

#### VULCAN CONTAINERS INC., Bellwood, Illinois

Gentlemen: I am interested in:

☐ Pails, in the following sizes.

☐ Hi-Bake protective linings for (product)

☐ 55 gallon drums.

Please get this information to—

Name .....

Company .....

Address .....

City .....

Zone ... State .....

Check 2086 opposite last page.



## FISCHBEIN Portable BAG CLOSER

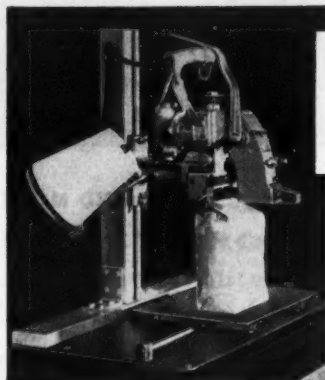
### HANDLES ALL TYPES OF BAGS!

- Total weight: 10½ lbs.
- Requires no installation... plug into any outlet
- Simple to operate and maintain
- Lowest priced bag closer on market

FULLY GUARANTEED!

OPTIONAL SUSPENSION  
UNIT ADAPTS MACHINE  
TO STATIONARY USE

## NEW! FOR CLOSING SMALL BAGS!



FISCHBEIN  
TABLE MODEL  
CARRIAGE  
CONVEYOR  
(Model F5)

One simple knob locks any Fischbein Portable Bag Closer into proper sewing position. Carriage slides freely and returns automatically to starting position, ready for next bag.

**UNIQUE VERSATILITY!** Any Fischbein Bag Closer can be used 3 different ways!

1. Completely portable
2. Suspended with counterbalance
3. On carriage conveyor for closing small bags

FOR DETAILS, MAIL THIS COUPON TODAY!

**DAVE FISCHBEIN CO.,** DEPT. 9B  
2730 30th Ave. S., Minneapolis 6, Minn., U.S.A.

Name \_\_\_\_\_  
Firm Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

Check 2087 opposite last page.

## PACKAGING

resistant to alkalies and most acids.

It is light in weight, resilient, and dimensionally stable under extreme conditions of cold and heat up to melting point of nylon.

Tests show that the material cannot mat and retains its characteristics through repeated immersions in water.

**Description:** Batting is made by crimping nylon fibers and then permanently locking them together by a patented chemical-thermal process. It is produced in range of weights from 2 to 8 oz per sq yd, and is available in any width to 55 in.

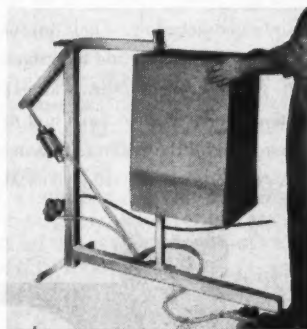
(Ny-Sul-Loft batting is manufactured by Star Woolen Co., Dept. CP, Cohoes, N. Y.)

Check 2088 opposite last page.

### Sets up cartons in few seconds

Air-operated stapling machine weighs only 95 lb

**Uses:** Setting up any style carton — regular, end-slotted as well as overlap. With arm attached, machine can erect telescope boxes, staple multi-wall bags, set up flat pieces of interior packaging, or handle numerous other stapling jobs.



Air-operated bottom stapler is available with combination of arm and post.

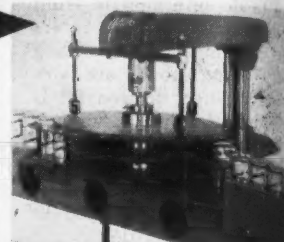
**Features:** Air-operated stapler does not use electrical connections, or moving parts in stapling head. Operation is fast, as cartons can be set up

## Coding Problem

There's a **Gottsch** automatic code-dating machine for every package, every purpose

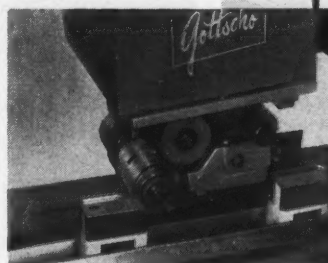
### Bottom-Coder

Portable space-saving unit imprints codes on bottom of jars, bottles, cans, etc. as part of an existing production operation. Imprint surface may be flat or concave, flush or recessed. Wheels right up to the line, can be moved about at will. ("Model TB" MARKO-CODER® IMPRINTER).



### Top-Coder

Motor-driven imprint attachment places code dates, other characters, legends on top surface of round or rectangular cans, canisters, jars, etc. Attaches to conveyor packaging machine. Accurately positions imprint in any desired location. (ROLAPRINTER® MACHINE)



Submit details of your coding problem, appropriate literature and our recommendation.



**ADOLPH GOTTSCHO, INC.**  
Dept. W, Hillside 5, N.J.

Automatic Production-Line CODING, MARKING, IMPRINTING MACHINES  
In Canada: RICHARDSON AGENCIES, LTD., Toronto & Montreal

Check 2089 opposite last page.



## Get Better Packaging and Lower Packaging Costs

Among the wide range of shapes, sizes, closures, and colors we now produce, there's one that will fit your needs—without mold costs.

Jewel-colored Clearsite containers are moisture-tight, dust-proof, easy to multi-color print. Because they are shatter-proof, they minimize breakage cost—their light weight means lower shipping charges.

Write for free samples and descriptive literature to Dept. G.

**CELLUPLASTIC CORPORATION**

Sales and Executive Offices • Newark, N.J.

Check 2090 opposite last page.

CHEMICAL PROCESSING

in few seconds

**Description:** weighs 95 lbs. moved to various areas as required. purchased at post and arm only, or arm

(Model BSA) manufactured by Stapling Co. Herrin, Ill.)

Check 2091

**Permits exposure to be dispersed from aerosols**

Metered mg to 3 g

**Uses:** S amounts from grams from containers. also design porating the

**Features:** are pre-measure for the-right-an

Valve dispensed from any

**Description:** all present valve has acceptance on standard model, the designed staining minimum contents which dispensers, no pocket or p

(Metered) vials by Inc., Dept. Court, Brid

Check 2092

NOVEMBER



in few seconds.

**Description:** Machine weighs 95 lb and can be moved to various packaging areas as required. It can be purchased as combination of post and arm, or with post only, or arm only.

(Model BSA-Jumbo stapler is manufactured by Container Stapling Corp., PO Box 247, Herrin, Ill.)

Check 2091 opposite last page.

**Permits exact amount to be dispensed from aerosol cans**

Metered valve delivers 50 mg to 3 grams

**Uses:** Spraying exact amounts from 50 mg to 3 grams from pressure filled containers. Manufacturer will also design containers incorporating the valve.

**Features:** Metered valves are pre-measured in manufacture for dispensing "just-the-right-amount" spray.



Valve dispenses exact amounts from any aerosol container

**Description:** Adaptable for all present aerosol containers, valve has already proven acceptance on glass, plastic, and standard metal containers. To date, the company has designed stainless steel and aluminum containers for applications which include oral dispensers, nasal sprays, and pocket or purse atomizers.

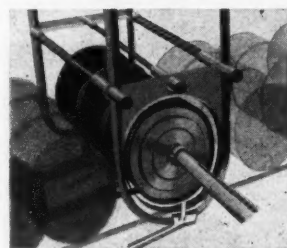
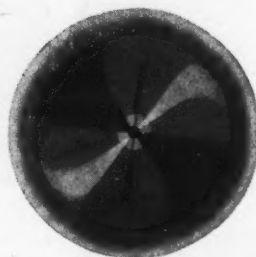
(Metered valve is manufactured by Emson Research, Inc., Dept. CP, 118 Burr Court, Bridgeport, Conn.)

Check 2092 opposite last page.

# Rheem centrifugally sprayed drum linings...a revolutionary new development

*Here are the reasons why...*

**Rheem-developed spray wheel**—This wheel is the secret of the revolutionary new lining application process now used by Rheem in producing lined drums. The new Centrifugal Sprayer spins off a continuous curtain of finely atomized lining material at a controlled, uniform rate over all inner surfaces.

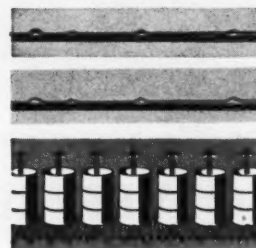
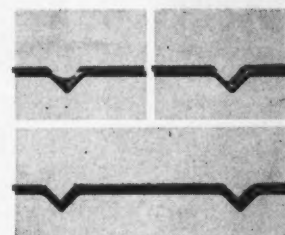


**Material applied uniformly**—Drum after drum! Uniform lining thickness, controlled to within .1 of a mil. Uniform viscosity of lining materials with lower solvent content. Uniform application.

**Checks prove uniformity!** Rheem applied linings are checked repeatedly in Rheem laboratories with super-sensitive film thickness gages, and in the field, time after time, on rough and tumble test-trips. All checks prove that when a drum lining is applied by the new Rheem Centrifugal Spray Process, all surface areas are—and stay—completely and uniformly coated. This new process is so automatic, linings cannot vary from one drum to the next.



**No more globs or skips!** Uneven linings and "holidays" or skips (right above) which are the result of the non-uniform application of lining materials, air-turbulence or the human element, are eliminated. Linings are completely uniform on all surfaces (right below).



**No trace of blisters or pinholes!** In the new Rheem Centrifugal Spray, no air is used and the solvent content of lining materials is vastly reduced. Air or solvent cannot be trapped in the material to cause blisters which break during the curing process and result in pinholes in the linings.

**Uniform curing!** Centrifugal spraying and the use of Rheem's new vertical oven baking make possible a curing job never before equaled. In these 3-stage high-temperature ovens, evenly-heated air flows vertically through the drums, curing linings uniformly. And the use of lining materials with low solvent content results in tougher linings that stand up better, last longer.



YOU CAN RELY ON



WORLD'S LARGEST MAKER OF STEEL SHIPPING CONTAINERS

For full details write: Rheem Manufacturing Co.  
Container Division, 1701 Edgar Road, Linden, N. J.

Plants and Sales Offices: Richmond and South Gate, Calif. • Chicago • Linden, N.J. • New York • Houston • New Orleans • Sparrows Pt., Md.

Check 2093 opposite last page.



Another first for 3M Research...

## NOW...POLYESTER FILM YOU CAN HEAT SEAL!

Impossible? Not any more! "Scotchpak" Brand Polyester Film takes a seal as tough as the film itself—and easily: a temperature of 275° to 359°F. and 20-60 psi is all that's required.

"Scotchpak" is the perfect packaging material for critical applications where inertness of the wrapper and protection of the contents under extreme temperature conditions is vital. It resists most solvents and chemicals, has high moisture inertness and high tensile strength.

You can use "Scotchpak" for packaging such varied products as cosmetics, acids, syrups, silverware, oils, greases, adhesives, asphaltics, catsup and mustard, surgical dressings—and many others. It even makes an ideal container liner or insulation pillow.

For more information, send for the folder described at right.

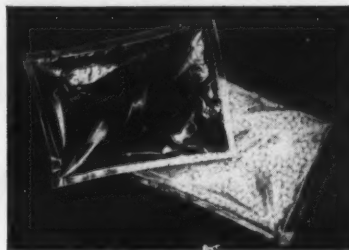
TRADEMARK  
**"SCOTCHPAK"**  
BRAND

**HEAT-SEALABLE POLYESTER FILM**

The term "SCOTCHPAK" is a trademark of Minnesota Mining and Manufacturing Co., St. Paul 6, Minn. Export Sales Office: 99 Park Ave., New York 16, N.Y. In Canada: P.O. Box 757, London, Ontario. © 3M Co., 1956.

Check 2094 opposite last page.

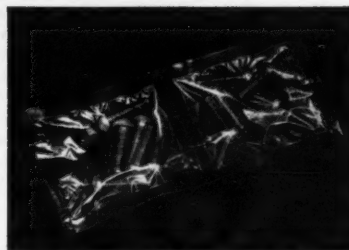
**Look what you  
can do with it!**



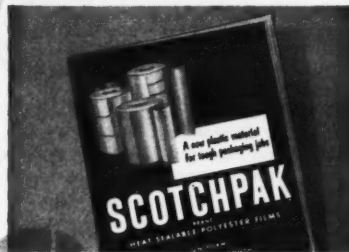
**ACIDS** or volatile chemicals can be packaged easily, handled safely, shipped without fear in heat-sealable containers of new "Scotchpak" Polyester Film. Also lines drums and cartons.



**FOOD ITEMS** are packaged safely in clear-as-glass "Scotchpak" Film. Contents can be frozen... even boiled right in the package. Low gas penetration rate... inert and non-toxic.



**METAL PARTS** can be packaged dry or in oil or grease to protect them against corrosion. Transparent packages are easy to handle, easy to ship and to store. Simplifies issuing of parts and units.



**FREE FOLDER** shows dozens of ways you can solve your most difficult packaging and shipping problems with new "Scotchpak" Polyester Film. Just write on your letterhead: Film Products Group, 3M Co., St. Paul 6, Minn., Dept. OL-117.



### PACKAGING

#### Bags for explosives

Illustrated bulletin describes specialized bags for explosives. Information on laminated burlap bags, multiwall paper bags, and polyethylene plastic bags is included. Explosives Bag Bul — Charles Bag Co., 309 W. Jackson Blvd., Chicago 6, Ill.

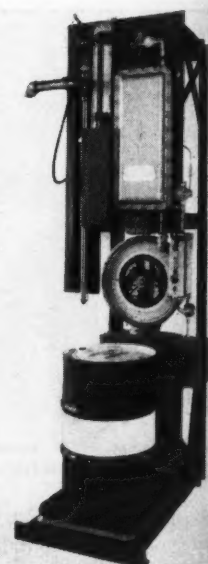
Check 2095 opposite last page.

#### Fast, accurate filling with no foaming

Scale dial gives tare, net and gross weights

**Uses:** Filling drums at high speeds with low-viscosity lubricants or chemicals having foaming characteristics.

**Features:** Filling machine prevents foaming, gives for maximum displacement in



Unit gives accurate, fast, drum filling with no foaming

drum. Mercury, magnetic, cut-off controls provide high accuracy.

**Description:** Sub-surface filler nozzle features circumferential discharge of fluid. Filler ram, actuated by pneumatic cylinder, automatically remains just below rising surface of fluid. Nozzle has no-drip design.

Special char...  
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weights on s...  
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through use...  
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and dribble

(Sub-surface...  
manufactured...  
Co., Toledo...  
Check 2096 o...

#### Packaging

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"... and...  
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Thanks to Ken...  
der Co., Holy



## PACKAGING

Special chart makes possible reading of tare, net, and gross weights on scale dial. Accurate tare control is obtained through use of fully automatic tare device.

In operation, drum is positioned and operator presses button to start automatic cycle of tare compensation, filling to selected weight, and accurate cut-off. Changes in filling weight can be set up readily, and dribble feed is available.

(Sub-surface drum filler is manufactured by Toledo Scale Co., Toledo 1, Ohio.)

Check 2096 opposite last page.

### Packaging movie

Based on nine case histories, talkie slidefilm in color documents saving in materials handling and packaging made possible by corrugated bulk containers of various types. "Simple Arithmetic in Packaging" — Gaylord Container Corp., Div. of Crown Zellerbach Corp., 111 N. 4th St., St. Louis 2, Missouri.

Check 2097 opposite last page.



"... and with your new promotion this company supplies you with free transportation."

Thanks to Ken Boyea, Hercules Powder Co., Holyoke, Mass.

CONTINENTAL

# FIBRE DRUMS



## The finest containers available for variety, versatility and value

No matter what product you pack, Continental Fibre Drums offer you the widest choice of size, style, and design, combined with rugged durability. From protecting chemicals to preserving the fragrance and freshness of spices, you are sure your product is safe. It has the protection of a superior container.

And Continental offers real value because you

get top quality at low cost. The light weight of these fibre drums cuts down on high freight costs, too.

You get service because our fibre drums are tailor made to suit your product. So get all the advantages of Continental Fibre Drums . . . Leverpak, Stapak, or Fiberpak. You have the finest when you pack your product in a Fibre Drum by Continental.

**CONTINENTAL © CAN COMPANY**

FIBRE DRUM & CORRUGATED BOX DIVISION, NEW YORK, N. Y.

Van Wert • Philadelphia • Pittsburgh • Tonawanda • Cleveland • Chicago • Atlanta • St. Louis • San Francisco • Los Angeles • Eau Claire • Boston

Check 2098 opposite last page.



# TYPICAL FORMULATIONS

## PVAc MASONRY PAINT

61 gal total

De-ionized water  
Carbitol  
Defoamer  
Fungicide (dry)  
Methyl cellulose (dry)

Mix briefly

Add 425# total

Rutile TiO<sub>2</sub> Chalk-resistant  
Anatase TiO<sub>2</sub>  
Talc

Run 15 min

Paste dropped to PVAc and balance of water added.

Makes 250 gal. Total running time: 32 min.

Pigment disperses very quickly. Grand Rapids finds that methyl cellulose may not be in solution when batch is dropped, but will be when batch has been tinted (24 hr).

(MC could be dissolved in advance, if desired.)

## FLATS

50%-solids odorless alkyd vehicle	36 gal
Odorless solvent	54
Pigments—Rutile TiO <sub>2</sub> and Titanium-calcium	750 lb
Run 10 min	

Diatomaceous silica	180 lb
Calcium carbonate	435 lb

Run one min	
Total running time: 40 min — Finished product:	167 gal

## GLOSS WHITE ENAMEL

NV vehicle solids in dispersion (%)	23
Pigment (by volume) in dispersion (%)	33
Rutile TiO <sub>2</sub>	1800 lb
ZnO (NJ Zinc — Kadox 515)	105 lb

Dispersed in odorless alkyd vehicle

Total running time: 40 min

NS fineness 7.5 reached in 20 min

Gloss of 88 reached in 40 min

Finished product: 575 gal

## FURNITURE POLISH

140 gal of oil-in-water emulsion are made in 40 min. of running time. Emulsion tested stable for one year.

Using high-speed dispersion mill,  
Grand Rapids Varnish Corporation—

# Makes oil or water paints and furniture polishes at 1/3 previous milling cost



Pigments are added to vehicle in mill as fast as liquids can incorporate them. Mill gives fast, efficient dispersion



R. E. Bash shows how bottom of mill extends through ceiling of floor beneath. Batches are dumped into storage tanks, preparatory to drumming



**PROCESSING  
EQUIPMENT**

**FRANK McELROY**  
Associate Editor

With **ROBERT E. BASH**  
Production Engineer  
Grand Rapids Varnish Corp.  
Grand Rapids, Michigan

**P**roblem: Grand Rapids Varnish Corporation wanted to expand the production facilities for their line of flat paints and furniture polish, with as little increased investment and labor cost as possible. They sent sample formulations to, and visited, a number of mill manufacturers.

**Solution:** After evaluating results, relative labor costs, mixing times, and capital investments, they installed — 4 years ago — a model 4B60 Kady mill powered by a 60-hp motor.

Mill handles batches of from 80 to 175 gallons at a time. The vehicle portion of the dispersion-base is added first, with the mill running. Pigments are added as fast as they can be incorporated. These ingredients are milled until the desired fineness is attained.

Dispersion takes place as the liquid is drawn by the rotor within the slotted stator at the bottom of the mill's stainless steel tank. Solids impinge against the slots and are reduced in size.

**Results:** The mill is quite versatile — water paints, some oleoresinous paints as well as furniture polish can be made. Relative milling costs are about 1/3 of those previously experienced. When additional capacity was needed two years ago, they installed a second Kady mill, similar to the first.

Formulas that Grand Rapids has developed are given in the table on facing page.

(Mill is made by Kinetic Dispersion Corp., 95 Botsford Pl., Buffalo 16, New York.)

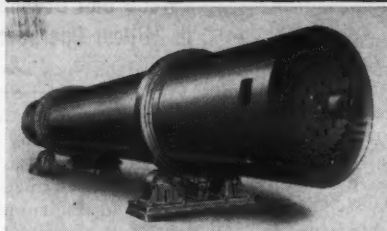
Check 2099 opposite last page.

# "DAVENPORT"

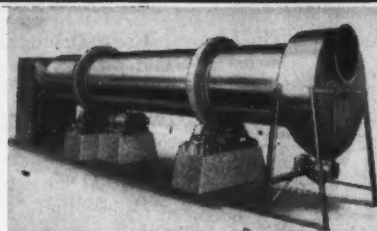
PRESSES—DRYERS—COOLERS

## made to your SPECIFICATIONS

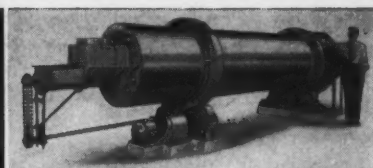
BOOTH 818 — NEW YORK SHOW



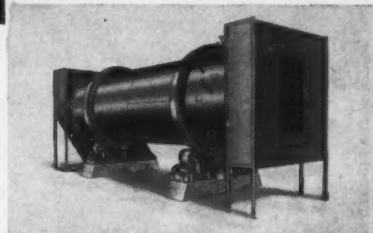
"Davenport" Rotary Steam Tube Dryer for drying soybean flakes.



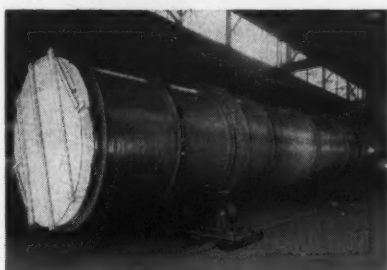
"Davenport" Rotary Hot Air Dryer drying whey powder, a by product from the manufacture of cheese.



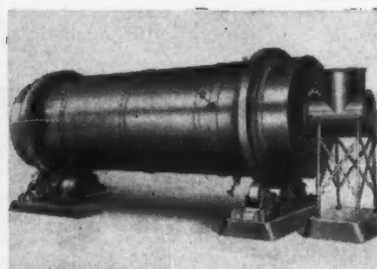
"Davenport" 3' - 6" Dia. Rotary Water Tube Cooler.



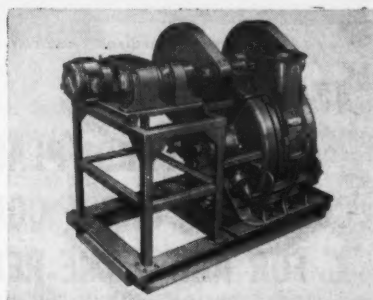
"Davenport" Rotary Hot Air Dryer for drying wheat gluten.



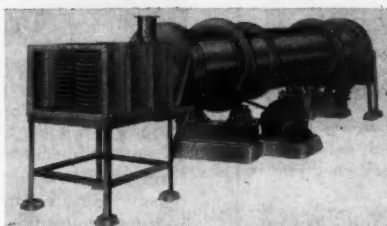
"Davenport" Rotary Hot Air Dryer fabricated from stainless steel for drying Adipic Acid.



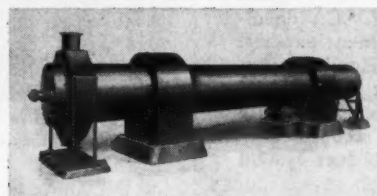
"Davenport" Rotary Cooler fabricated from aluminum, for cooling molten alum.



"Davenport" Continuous De-Watering Press made in three sizes for various capacities.



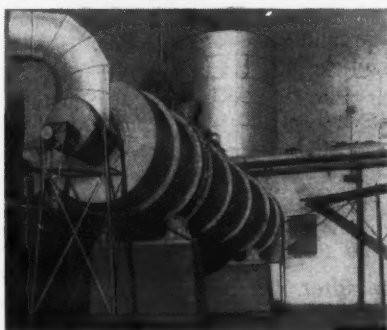
"Davenport" Rotary Hot Air Dryer for drying heat sensitive materials.



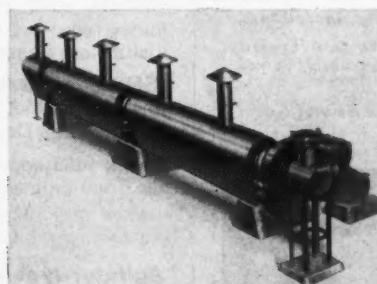
"Davenport" Rotary Steam Tube Dryer, drying sodium and potassium perchlorates.



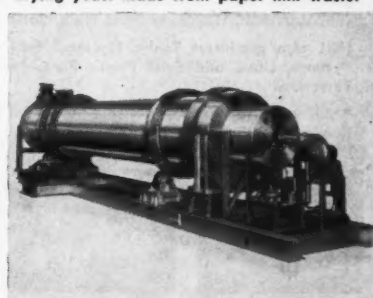
"Davenport" Double Drum Atmospheric Dryers drying yeast made from paper mill waste.



"Davenport" Rotary Air Cooler cooling soybean meal from a solvent extraction process.



Special "Davenport" Rotary Indirect Fired Dryer fabricated of special stainless steel using natural gas as heating medium.



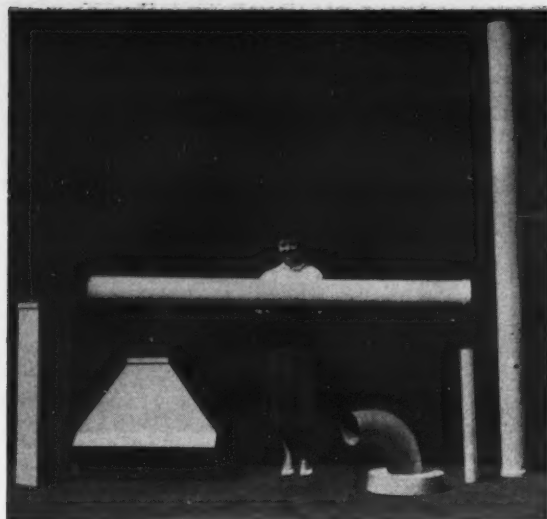
"Davenport" Rotary Direct Fired Dryer for drying and calcining welding flux.

**I**f you have a De-Watering — Drying or Cooling problem, our experienced engineers with our pilot plant can assist you with your problems. For quick reference, see Chemical Engineering 1957 catalog, or write for our Catalog C.

**DAVENPORT MACHINE AND  
Foundry Company**  
Davenport, Iowa, U.S.A.

Check 2100 opposite last page.





Various standardized fume removal units.

## AVAILABLE: STANDARD\* PLASTIC CORROSION PROOF COMPONENTS FOR ACID FUME REMOVAL!

You can easily install corrosive fume removal systems, using lightweight, easy-to-handle, standardized components of RIGIDON (fiber glass reinforced) and RIGIVIN (Vinyl P.V.C.) developed by Heil corrosion proof equipment experts. These standard components include: Hoods, Ducts, Stacks, Fittings, Tank Covers, Flat Sheets, and Cementing Kits. And HEIL will help you — write describing your fume problem, for recommendation of the type and size of plastic duct system to use.

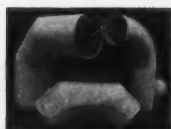
Ask us to send standard parts catalog sheets.

**HEILASTIC LININGS** — Rubber, Koroseal, Plastic.

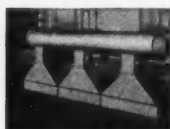
**METAL FABRICATION** — Steel Plate, Sheet Metal, Lead, Alloys.

HEIL also produces: Tanks, Heaters, Heat Exchangers, Exhaust Systems, Lined and Solid Plastic Fans, Fume Scrubbers, Packed Towers.

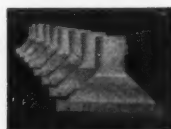
\*HEIL will also "custom-fabricate" a special fume removal system to your specifications, regardless of size.



Light, strong elbows and fittings.



Units are easily assembled, using standard cementing kit.



Hoods furnished complete in standard sizes.

One source — One responsibility



### HEIL PROCESS EQUIPMENT

CORPORATION

12901 Elmwood Ave. • Cleveland 11, Ohio

Check 2101 opposite last page.

## PROCESSING

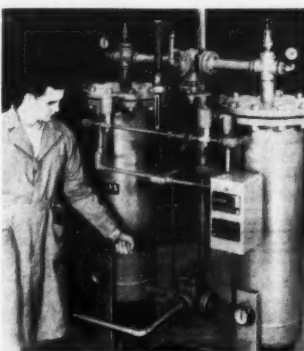
**Air, process gas dryers operate on an 8-hour reactivation cycle**

Manual units need attention only once per shift

**Uses:** Drying instrument air and process gases.

**Features:** Dehydrators operate on an 8-hour reactivation cycle, so that manual and semi-automatic models require attention only once per shift.

**Description:** Steam-reactivated dryers are available in 11 sizes, handling from 10 to 1000 scfm (air at 70°F and 100 psig). Units operate continuously and can be provided with manual, semi-automatic,



Tower inspection and desiccant charging is simple job on dryer

or automatic cycling. Tower inspection and desiccant charging is simple. Desiccant changes and other maintenance can be done without disturbing steam coil.

(Steam-reactivated dehydrators are product of Selas Corp. of America, Dresher, Pa.)

Check 2102 opposite last page.

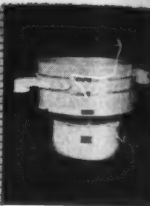
**Agitator-type disc filter uses no packing gland or sealing water**

Keeps maintenance problems to minimum

**Uses:** For pulp filtration.

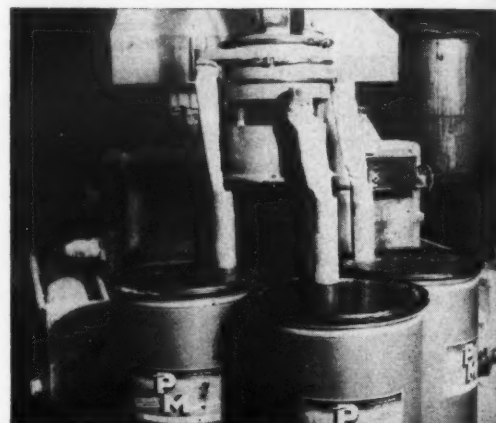
**Features:** Packing gland, sealing water, and bearings in tank have been eliminated making maintenance almost negligible. Agitator mecha-

## SCREENING NEWS



**SWECO Unit Doubles Sulphonate Salt Capacity in 24-Hour Operation for Chemical Firm**

Round-the-clock operation of an 18" diameter SWECO Vibrating Screen Separator has helped double capacity for Essential Chemicals Company of Fredonia, Wis. This company is one of the nation's large manufacturers of alkyl aryl sulphonate (sodium salt). The company uses this sulphonate salt for its own detergents and also supplies other manufacturers.



Dust-free operation of this SWECO Separator was a major factor in its selection by Essential Chemicals for use in screening sodium base.

Essential's specifications require a sodium base of uniform particle size, which provides control of product density. Ease of changing screen cloths on the SWECO unit permits rapid selection and installation of desired screen cloth opening. This enables the company to obtain densities specified by customers.

The SWECO Separator requires no attention during operation. Its compactness and dust-free design were major factors in its selection by the chemical firm.

**New 30" Separator Rounds Out SWECO Line**

This versatile, new intermediate size SWECO Separator makes it possible to select the exact size you need. It combines the outstanding features of both the small and large models, including laboratory-accuracy and high-production capacity. Your nearby SWECO District Engineer will demonstrate, in your plant, how a SWECO Separator can solve your screening problems.

A complete catalog describing the new 30", its applications and construction features, is yours for the asking. Write for Bulletin S-106R-3.



**SOUTHWESTERN  
ENGINEERING  
COMPANY**

4900 Santa Fe Ave., Los Angeles 58  
LUdlow 3-6262—Cable: SWECOLA

Engineers and Constructors...Manufacturers

Check 2103 opposite last page.

CHEMICAL PROCESSING

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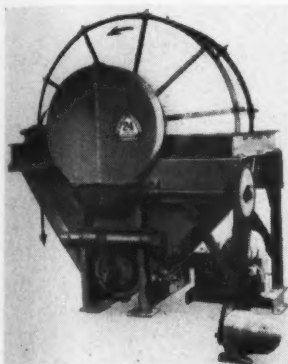
NOVEN



## PROCESSING

nism is easily removed for servicing.

**Description:** Pulp agitation is supplied by pulsating unit located below filter discs. Agitation mechanism is designed and located so as to provide correct amount of agitation to keep solids in suspension. Agitation speed is adjustable to



Agitation on filter is by pulsating unit below filter discs

maintain homogeneous pulp regardless of its nature. Greater capacity and lower final moisture are reported because of more uniform cake distribution over filter sector. Filters are in 4, 6, 9' diameters.

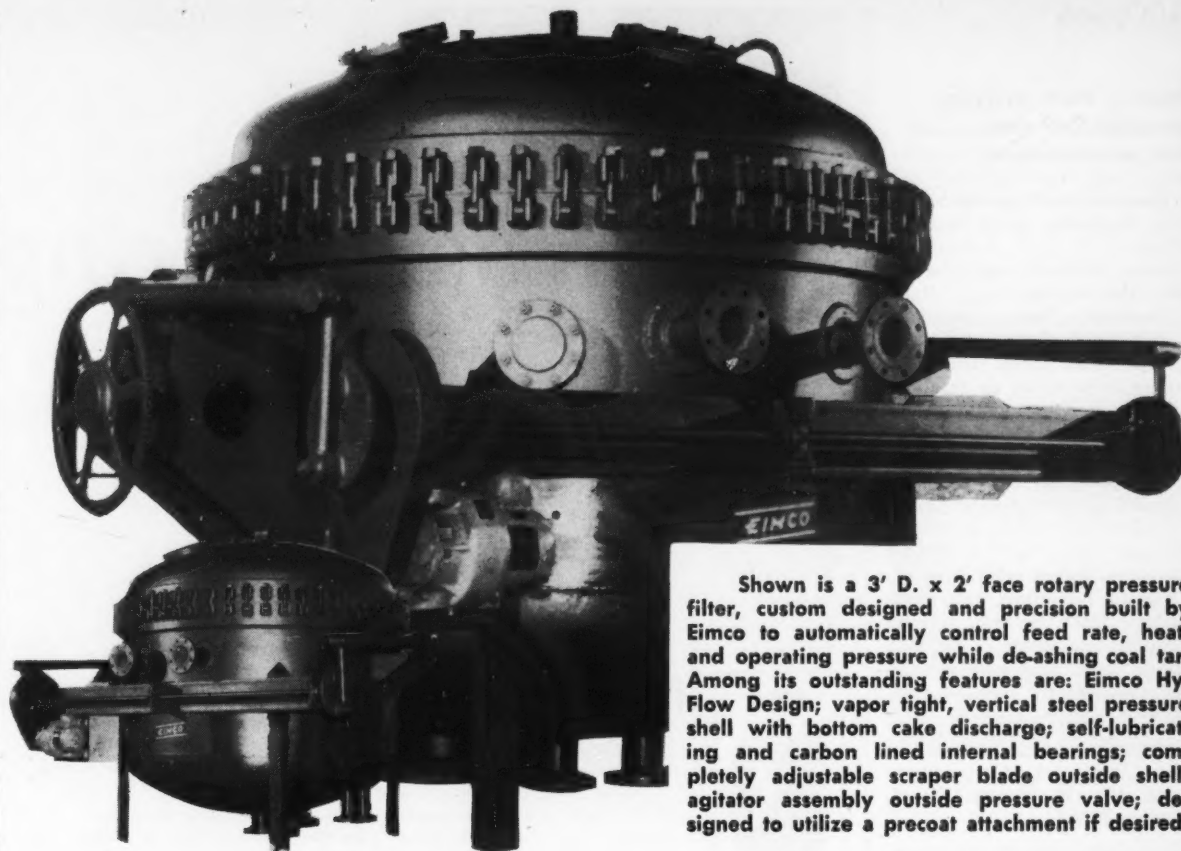
(Disc filter is product of Denver Equipment Co., PO Box 5268 Denver 17, Colo.)

Check 2104 opposite last page.



"That always happens at 20,000 rpm."

Thanks to James V. Redding, The Central Pharmacal Company, Seymour, Ind.



Shown is a 3' D. x 2' face rotary pressure filter, custom designed and precision built by Eimco to automatically control feed rate, heat, and operating pressure while de-ashing coal tar. Among its outstanding features are: Eimco Hy-Flow Design; vapor tight, vertical steel pressure shell with bottom cake discharge; self-lubricating and carbon lined internal bearings; completely adjustable scraper blade outside shell; agitator assembly outside pressure valve; designed to utilize a precoat attachment if desired.

### TESTS MAY PROVE . . .

## EIMCO PRESSURE FILTRATION IS YOUR BEST ANSWER, TOO!

In the production of coal tar, about 20% fine ash residue is retained in the crude tar from a low temperature carbonization process. Before further processing, the ash must be reduced to 0.1% or less.

Our client wanted a filter station designed to economically process a slurry (solvent and tar - 1 to 1 volume ratio) at a 30 to 36 thousand gallon per 24 hour flow rate and meet this rigid purity requirement.

Extensive leaf and pilot plant tests provided proof that filtering at highest possible pressure was most feasible for de-ashing coal tar. Continuous pressure filtration also offered definite economic advantages in total operating cost per gallon of filtrate produced.

A rotary pressure filter was precision built by skilled Eimco technologists to meet exacting process

requirements determined by the tests. This Eimco Filter's many special design features, materials of construction and carefully selected filter medium permit efficient processing of the tar concentrate at a high flow rate under maximum temperature and pressure.

Eimco has applied continuous pressure filtration to meet exacting requirements of many chemical, petroleum, pharmaceutical and food processors . . . just to name a few. And new applications are being discovered every day!

Size and complexity make no difference to the efficient service Eimco offers process industries. Whether it's an order for vacuum or pressure filters, Eimco's complete facilities are geared to produce to the strictest design standards. Contact us early in your planning!

## THE EIMCO CORPORATION

SALT LAKE CITY, UTAH

Research and Development Division, Palatine, Illinois  
Expert Offices: Eimco Building, 51-52 South Street, New York 5, N. Y.  
Process Engineers Inc. Division, San Mateo, California

BRANCHES AND DEALERS IN PRINCIPAL CITIES THROUGHOUT THE WORLD



B-291

Check 2105 opposite last page.

## PROCESSING

### Pleated filter cartridge has high flow rate, low pressure drop

Removes particles down to 5 microns

Uses: Filtering oil, water, and other liquids.

Features: Filter cartridge permits high flow rates, with low pressure drops. Unit will filter out particles as small as 5 microns. Continuous recirculation results in even finer filtration.

Description: Filter cartridge consists of fine-quality paper, impregnated with heat-stabilizing resin. Paper is pleated and cured at elevated temperature. Resulting extended-surface filter is then formed around metal center tube. End plates and protective shield are attached by special process.

(Type PL filter is product of The Hilliard Corporation, Dept. PL, W. Fourth Street, Elmira, N.Y.)

Check 2106 opposite last page.

### Tilting batch mixer

Bulletin of four pages presents information on manufacturer's tilting batch mixer, including dimensions and specifications. Mixers for various applications are shown. Bul B-12 — Gruendler Crusher & Pulverizer Company, Dept. CP, 2915 N. Market, St. Louis 6, Mo.

Check 2107 opposite last page.

### Centrifuge has fluid drive featuring variable-speed regenerative braking

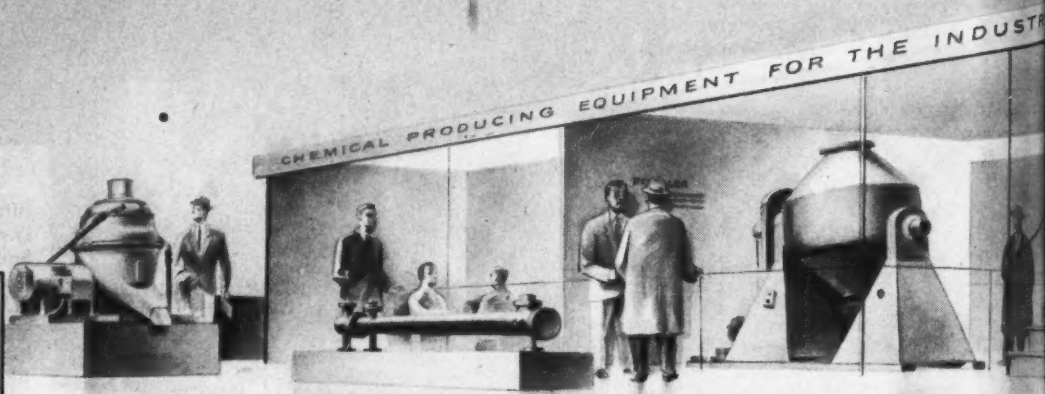
Basket capacities range from 9 to 16 cu ft

Uses: For separating various materials in chemical, pharmaceutical, or food processing industries.

Features: Unit is batch-type, bottom discharge machine with fluid drive and variable-speed, hydraulic, regenerative braking contained



# Corrosioneering News



As soon as you enter the Chem Show, you'll see the new "R" Series Glassed-Steel Reactor. Going down the line you'll see the Wiped-Film Evaporator, Heat Exchanger, Titan Centrifuge, Conical Dryer-Blender.

## You'll see it first at the Chem Show.

As soon as you enter the Chem Show you'll see looming above the floor the most advanced reactor design in more than twenty years.

It's one of the new "R" Series of Pfaudler glassed-steel reactors, today's most nearly perfect answer to processing with corrosives.

Come up on our observation platform and study the top head. Note the symmetry of the right and left halves of the top head. On this 1000-gallon reactor there are three four-inch nozzles on each half, each at the same angle to a centered eight-inch nozzle and an enlarged 30% manhole measuring 14 by 18 inches.

Neater Installations. Symmetrical heads make for easier, faster, and much more flexible installations . . . particularly when you use tandem hookups. A common pipe, for example, can feed two side-by-side reactors with short, straight lengths. Neater installation, more head room; less piping, too.

We put a special glass on the flange faces of the nozzles, so you can get lapped surfaces which permit plumb nozzle connections without time-consuming gasket shimming. These truer gasket facings result in safer operation at higher pressures and re-

duce dangerous seepage which could corrode tank exterior.

**Compact Agitator Drive.** The new "BH" drive is pedestal-mounted. No cumbersome, space-consuming tripod. The drive takes either seal or stuffing box which can be interchanged at your plant in minutes as single "Pfaudlerpac" unit without disrupting the drive alignment.

**Higher Jacket Velocity.** Reduced jacket clearance permits higher velocity and increased heat transfer.

A new jacket sealer vent is located right on the knuckle radius. Here it gives you almost complete exhaust of entrapped jacket vapors. The vent has a 3000-pound series coupling that takes a lot more punishment than the previous light-gauge coupling.

**Drainage.** Two more things, before you go downstairs. Look straight down through the manhole and you'll see the bottom head outlet. We put it off-center so that it's directly in the sweep path of the agitator. Gives you faster, more complete drainage.

The baffle holder is redesigned, too. New method of support gives larger bearing area and more latitude in adjustments. You can get either fingertip or beaver tail baffles.

**Bottom Head Improvements.** Lots of changes on the bottom head, too. Notice, for example, there are two three-inch clean-out ports for manual inspection and cleaning. One-and-a-half-inch reducing plates take them down to your pipe connection size. The diaphragm area is all stainless steel for better corrosion resistance.

There's lots more that's new in the exhibit, including these special items:

### WIPED-FILM EVAPORATOR

We've lifted the top head of this so that you can see its unique features. The floating carbon blades acted upon by centrifugal force, spread your distillands into very thin, uniform films. These films are wiped over the peripheral evaporating surface. They evaporate quickly because of the high heat transfer rate before they can be damaged through thermal decomposition.

### FIXED TUBE HEAT EXCHANGER

You can get a heat exchanger like this delivered to your plant in just two weeks from your order date. The tubes are 316 stainless. The shell is carbon steel. Capacities are 56, 104, 149, 216, and 316 square feet.

Even with larger sizes you can get four-to-six-week delivery, since we

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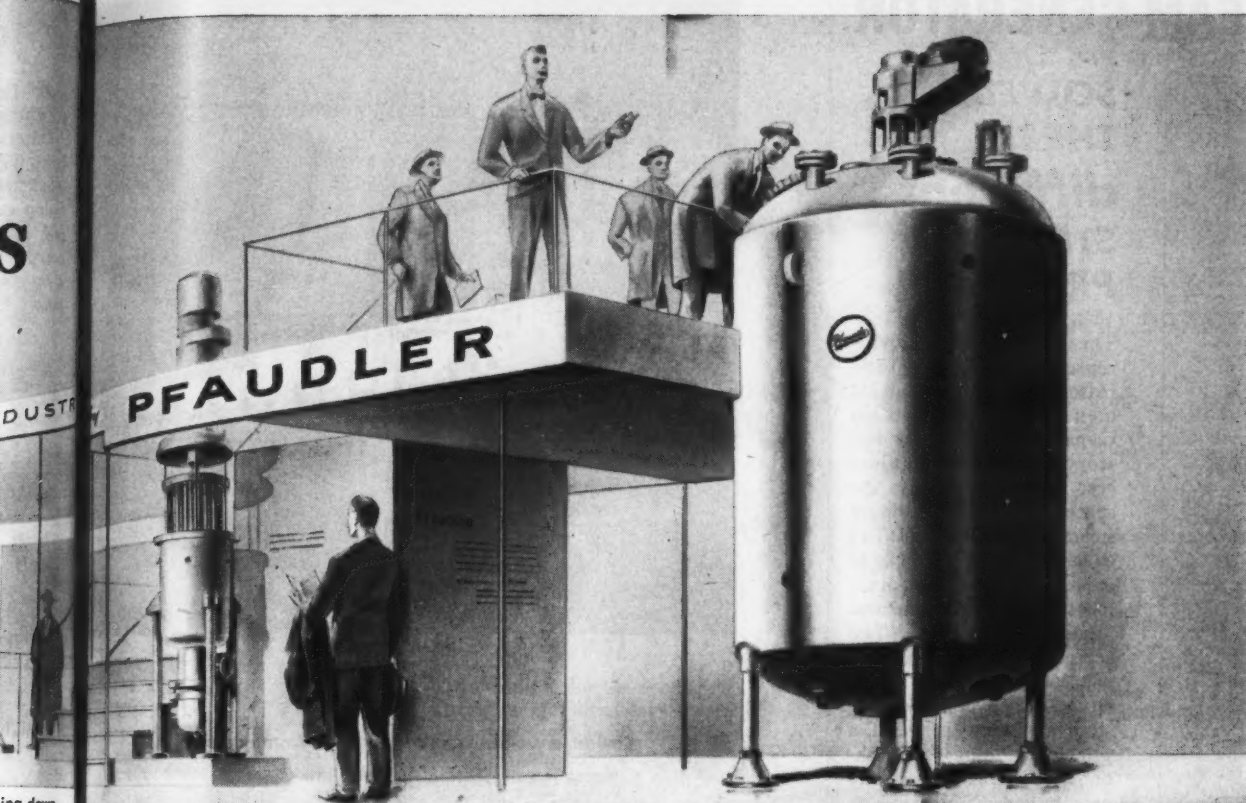
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On far side of exhibit not shown here, are a Dimple Jacketed Stainless Steel Reactor, a new kind of Dispersion Mill and a "P" Series Kettle with the new "W" Drive. See you at the show, Booths 110 and 141.

## a completely new "R" Series reactor

stock the various component parts.

There's a lot more information on our flexible standard and custom designs in a bulletin which you can sign up for before you leave.

### TITAN CENTRIFUGE

You can operate this centrifuge for as long as a month without shutting down for cleaning. It periodically desludges itself automatically while running at top speed.

Just for demonstration purposes, we're feeding a green mixture to the machine. You can see the lighter weight component come out as a clear, yellow liquid, and the heavier component as a clear, blue liquid. Push the button we've provided and watch the centrifuge desludge itself in less than 10 seconds.

This centrifuge works exactly the same with slurries running up to 35% solids by volume. It concentrates solids up to 40% dry weight while producing clear effluents. Costs less to run, too.

### CONICAL DRYER-BLENDER

This is a glassed steel unit that dries and blends materials simultaneously. One of our customers reports that he cut his drying time from four days to seven hours with one of these machines.

Look through the transparent outlet plate and you can see the blending action. The white and red chips inside ride up the side of the drum as it revolves and then cascade down into a homogeneous blend. Notice how much surface area is exposed by this action.

During actual operation the drum is under vacuum, so that liberated vapors are quickly pumped away.

Since the unit is glassed steel you can work with all the acids except hydrofluoric and any alkali below pH 12. Working capacities run up to 165 cubic feet.

### PUC MULTISTAGE DISPERSION MILL

Here's a completely new and improved way for wet milling and

grinding, homogenizing, dispersing, emulsifying, and extracting.

The mill serves as its own pump, drawing material down through a multistage grinding area to preset sizes and then ejecting the product in either batch or continuous runs. With the pumping action, the mill actually cleans itself. Gives you faster, lower cost production, finer particle sizes, and more stable mixes. Capacities from 44 to 6060 pounds per hour.

If, unfortunately, you aren't attending the show, you can get the literature by checking and sending the coupon below.



### THE PFAUDLER CO., a division of PFAUDLER PERMUTIT INC. DEPT. CP-117, Rochester 3, New York

Please send me: ☐ Bul. 960, "R" Series Reactors ☐ Data Sheet 39, Wiped-Film Evaporators ☐ Bul. 949, Heat Exchangers ☐ Bul. 946, Titan Centrifuges ☐ Data Sheet 26, Conical Dryer-Blenders ☐ PUC Dispersion Mills ☐ Bul. 951 "W" Drives.

Name.....Title.....

Company.....

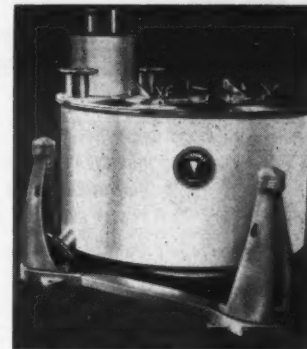
Address.....

City.....Zone.....State.....

Check 2108 opposite last page.

within motor.

**Description:** Centrifuge was originally designed and built by manufacturer five years ago, but was produced only on custom basis. Now in mass production, unit is available with either completely automatic, semi-automatic (with pushbutton station located on machine.), or manual operation.



Largest model centrifuge required only 7 ft headroom

Largest model requires only 7 ft headroom. Basket capacities range from 9 to 16 cu ft. Machine is loaded at top and discharged from bottom. It can be constructed of carbon steel, stainless steel, or other metals. Special plastic or rubber coating or linings are available.

(Tornado centrifuge is product of The Fletcher Works, Dept. CP, 201 Flenwood Ave., Philadelphia 40, Pa.)

Check 2109 opposite last page.

### Square inch of screen has 250,000 holes

Electro-deposited smooth metallic sheet with screen openings of 9 (0.0003573") and 12 (0.0004764") microns is now available. Made of pure nickel, the sheet is 0.0005" thick. Holes are round, conical in cross section. Sheet has 250,000 holes per square inch.

(Electro-plate screen is product of Pyramid Screen Corp., 181 Harvard Street, Brookline 46, Boston, Mass.)

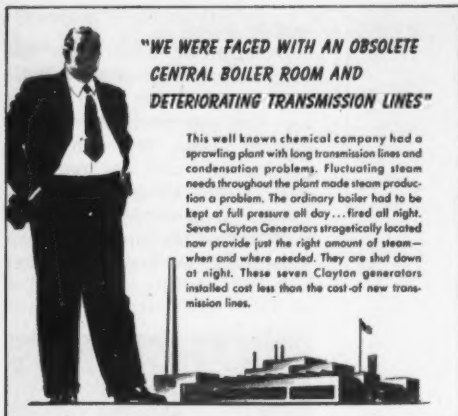
Check 2110 opposite last page.



# How a Clayton STEAM GENERATOR

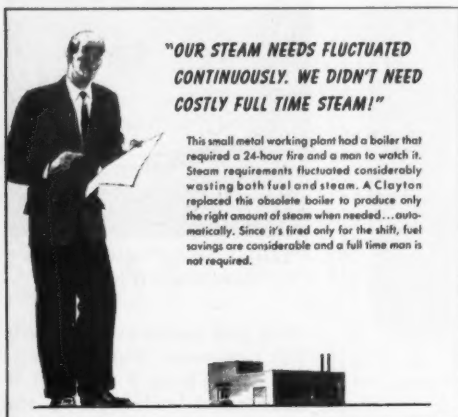
**"WE WERE FACED WITH AN OBSOLETE CENTRAL BOILER ROOM AND DETERIORATING TRANSMISSION LINES"**

This well known chemical company had a sprawling plant with long transmission lines and condensation problems. Fluctuating steam needs throughout the plant made steam production a problem. The ordinary boiler had to be kept at full pressure all day... fired all night. Seven Clayton Generators strategically located now provide just the right amount of steam—when and where needed. They are shut down at night. These seven Clayton generators installed cost less than the cost of new transmission lines.



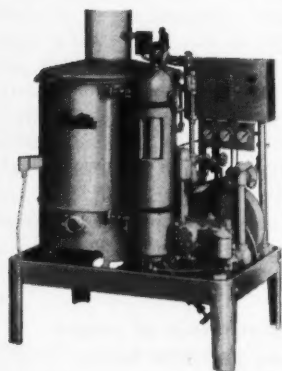
**"OUR STEAM NEEDS FLUCTUATED CONTINUOUSLY. WE DIDN'T NEED COSTLY FULL TIME STEAM!"**

This small metal working plant had a boiler that required a 24-hour fire and a man to watch it. Steam requirements fluctuated considerably wasting both fuel and steam. A Clayton replaced this obsolete boiler to produce only the right amount of steam when needed... automatically. Since it's fired only for the shift, fuel savings are considerable and a full time man is not required.



## SOLVED THREE different STEAM PROBLEMS!

These actual case histories represent only a few of the reasons why smart business men buy Clayton Steam Generators. Basically the story is more steam at less cost in only one fourth the space occupied by ordinary steam boilers. They cost less to install too... no stacks to erect, no walls to knock out, lower rigging expense and lower hauling costs. The secret of Clayton's higher efficiency is *controlled circulation*—no space consuming straight tubes, but instead, a principle of using a coil without fired vessels... easier to operate and maintain. From a cold start, Claytons produce steam in 3 minutes. Let a Clayton representative give you the complete facts.



### "IT WAS HOPELESS! WE NEEDED MORE STEAM AND WE DIDN'T HAVE ROOM FOR IT!"

Here was a well known beverage syrup company located in "midtown" squeezed in between buildings on all sides. To meet its additional steam needs, it went in only one direction... up! Since a Clayton produces the same amount of steam in only one fourth the space and weighs only a fraction as much as an ordinary boiler, it was relatively simple to put two Clayton steam generators on the roof! The installation was quick and inexpensive.



### EXCLUSIVE!

Compare Clayton's 5-year published coil warranty covering material and labor.

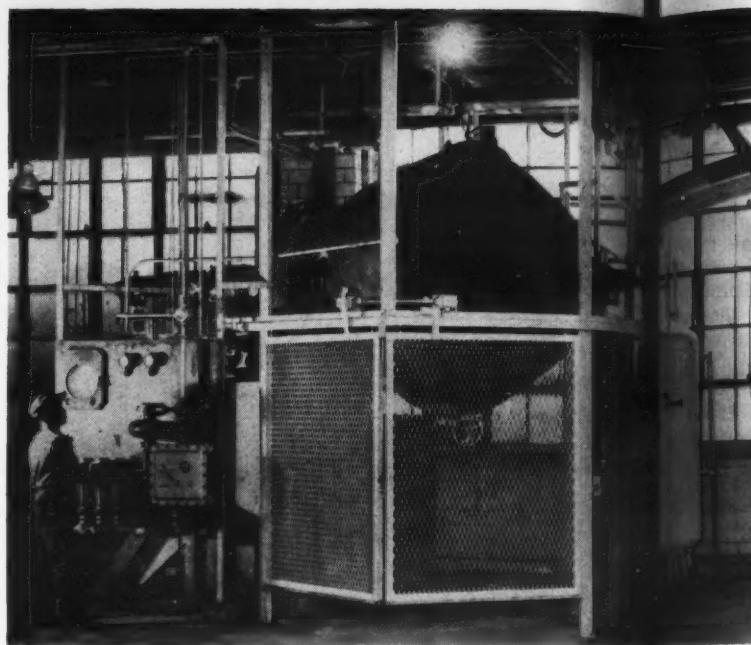


**Clayton**

MANUFACTURING COMPANY

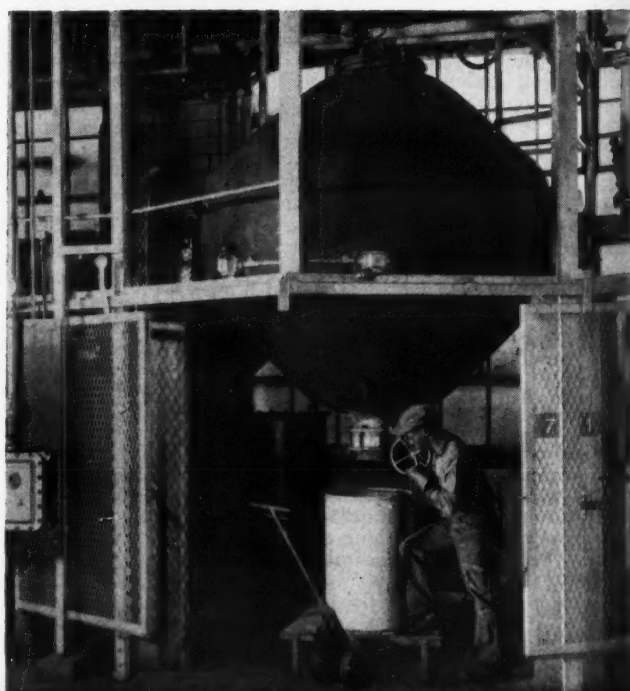
Sirs:  
Please send us more information on Clayton Steam Generators.  
Name \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_  
We use steam for \_\_\_\_\_

Send to: Clayton Manufacturing Company  
405 N. Temple City Blvd.  
El Monte, California



Conical dryer-blender streamlines delicate drying operation at Toms River-Cincinnati Chemical Corporation. In addition to boosting production and saving labor, unit...

## cuts drying time 88 percent and improves product quality



Check 2111 opposite last page.

Problem being caused by stuff in River-Cincinnati Chemical Corporation. Actual cost was 36 tional 8 handle t after dr total of The 10 mediate a pH of are sens particul perature The o ber-type eration. each un each par 8 pound per drye 840-960 Mater to be press, t area, lo weighed further ferred future u quired t one or handling cedures

Unloading ing conta to blende

## PROCESSING

◀ Glass-lined conical blender-dryer is used to dry 10 to 15 different dyestuff intermediates at Toms River-Cincinnati Chemical Corporation, Cincinnati, Ohio. Products have pH ranging from 3½ to 9

in product losses which were not recoverable.

The shelves upon which the trays were placed in the dryer also presented a problem. Constructed of ordinary steel with a thin layer of plastic coating, the shelves are hollow so that the trays can be placed inside them. Corrosion and contamination frequently resulted when pans were inserted.

**Solution:** In a continual search to reduce costs of and improve their products, Toms River-Cincinnati Chemical's management decided to install a 107-cu ft glass-lined conical dryer-blender to handle the dyestuff intermediates. Blender handles the equivalent of 240 pans or 1680-1920 pounds of material.

Unlike the shelves in the chamber dryers which dried the material from the bottom to the top, the tumbling action of the conical dryer promotes a more even drying while greatly reducing drying time per batch. Large surface areas of product are continually being exposed as dryer rotates. Drying is speeded by application of vacuum and heat.

The paste dyestuff intermediates are loaded into the blender by means of a large funnel inserted into top of unit from floor above. Dried product is removed through bottom valve and dropped directly into containers.

Ideally suited to the petrochemical, chemical, and pharmaceutical industries, blender meets the corrosion resisting process requirements in these fields. The dryer can be used with every acid except hydrofluoric and for alkalis up to pH 12 and 212°F. Its glassed-steel construction resists adherence and thus not only reduces cleanup losses and labor but improves heat trans-

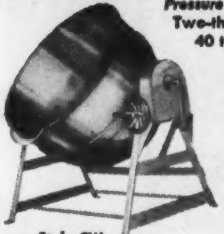
**Problem:** Excess time was being consumed drying dyestuff intermediates at Toms River-Cincinnati Chemical Corporation, Cincinnati, Ohio. Actual drying time per batch was 36 hours, with an additional 8 manhours required to handle the product before and after drying — resulting in total of 44 hours.

The 10 to 15 dyestuff intermediates being handled have a pH of from 3½ to 9. They are sensitive to air absorption, particularly at elevated temperatures.

The company used chamber-type dryers for the operation. Made of cast iron, each unit held about 120 pans, each pan containing from 7 to 8 pounds material. Capacity per dryer was therefore about 840-960 pounds.

Material to be dried had to be removed from filter press, transported to drying area, loaded into pans, dried, weighed, and taken to mill for further processing or transferred to storage area for future use. The operation required the full time services of one or two men. The various handling and transferring procedures involved often resulted

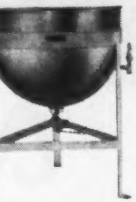
◀ Unloading is accomplished by raising container on hydraulic truck up to blender. This eliminates floor waste



**Pressure Kettle**  
Two-thirds Jacketed  
40 to 200 gal.



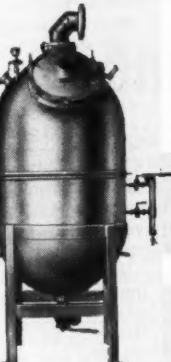
**Style CW Kettle**  
Two-thirds Jacketed  
80 to 300 gal.



**Style A Kettle**  
Two-thirds Jacketed  
5 to 500 gal.



**Style B Kettle**  
Full Jacketed  
10 to 300 gal.



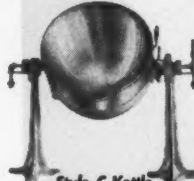
**Vacuum Pan**  
50 to 500 gal.



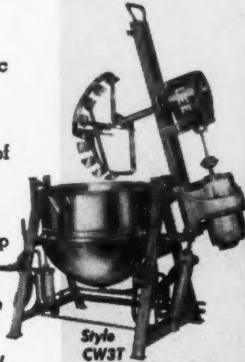
**Quick Cooling Pan**  
50 to 200 gal.



**Style A3T Center-line Scraper Agitator Kettle**  
25 to 300 gal.



**Style C Kettle**  
Two-thirds Jacketed  
5 to 100 gal.



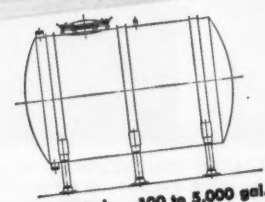
**Style CW3T Center-Line Scraper Agitator Kettle**  
80 to 300 gal.



**Mixing Tank**  
25 to 500 gal.



**Pulp Tank**  
500 to 2,000 gal.



**Storage Tank**  
100 to 5,000 gal.

**REDUCE YOUR PROCESSING COSTS**

WITH

**LEE EQUIPMENT**

**CORROSION-RESISTANT**  
Built from time-proved stainless steel

**WIDE RANGE OF SIZES**  
To fit your exact requirements

**INDIVIDUALLY DESIGNED**  
To meet your specific processing operation

**PRECISION-BUILT**  
To give you long years of peak performance

**LOW MAINTENANCE**  
Easy to clean and keep clean

Our technical bulletins describe this equipment in detail.  
*Write for them today!*

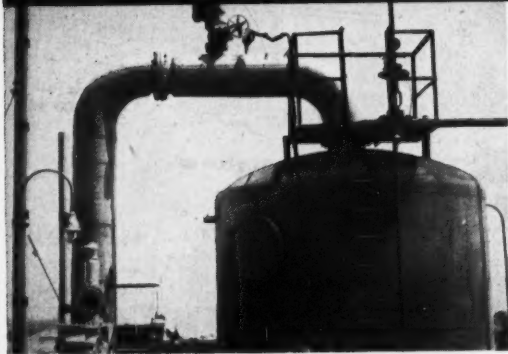
**LEE METAL PRODUCTS CO., Inc.**  
418 Pine Street, Phillipsburg, Pa.

ALL LEE KETTLES ARE MADE TO MILLS CODE

Check 2112 opposite last page.



**Life of vapor line on acid stripping tower at NATIONAL PETRO-CHEMICALS.....**



UNDER THE INSULATION YOU SEE HERE is the line of Revere Deoxidized Copper which has been in uninterrupted service for over a year, and as of this writing continues to serve. Line was fabricated by MATT. CORCORAN COMPANY, Louisville 13, Ky.

increased  
more than  
**800%**  
by switching to  
**COPPER**

**Copper line still going strong after 12 months without causing a single stripping tower shutdown!**

At left is an unretouched photograph of a former overhead vapor line, 18" in diameter, that started to leak after 3 weeks on an acid stripping tower of an ethyl alcohol unit at National Petro-Chemicals Corp., Tuscola, Illinois.

This 10 gauge corroded line was then replaced by another line of a different metal. This lasted 6 weeks, then another failure. Such breakdowns not only are troublesome, they are mighty costly, too.

Original tests of the bubble-cap stripping tower, which removes dilute sulfuric acid from alcohol, showed that vapor from top of tower should contain only alcohol, some hydrocarbons, and SO<sub>2</sub>. But after two shutdowns due to failure of the metals used, a re-examination disclosed that throughput was running slightly higher than anticipated. As a result there was a carry-over of some concentrated sulfuric acid. A line was then ordered, fabricated from Revere Deoxidized Copper, and placed in service. Copper could be used safely as there was no air in the system.

This copper line has now been in service over a year without failing and the stripping tower operation remains uninterrupted.

Another example of selecting the right metal, in the right form to do the best possible job with the greatest economy . . . whether it be copper, brass or aluminum or any one of their alloys. Perhaps Revere can help you realize similar savings due to superior performance of its metals.

**REVERE COPPER AND BRASS INCORPORATED**

Founded by Paul Revere in 1801  
230 Park Avenue, New York 17, N. Y.

Mills: Rome, N. Y.; Baltimore, Md.; Chicago, Clinton and Joliet, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Brooklyn, N. Y.; Newport, Ark.; Ft. Calhoun, Neb. Sales Offices in Principal Cities, Distributors Everywhere.



**PROCESSING**

fer. Possibility of metallic contamination is also eliminated. Unit's internal pressure range is from full vacuum to 20 psi.

**Results:** Actual drying time per batch has been cut from 36 hours down to 4 hours — or about 88 percent. Furthermore, since blender handles the equivalent of 240 pans of material, it is actually drying twice as much per load as a chamber-type unit used to handle. Labor costs have been reduced 50 percent, since twice the amount of material is dried by the same number of men as by the old method.

Since products exhibit sensitivity to air absorption at elevated temperatures, use of conical dryer has also improved product quality, because less time is required for the drying operation. Product losses formerly experienced because of various handling and transferring procedures, have been drastically cut.

(Glass-lined conical dryer-blender was supplied by The Pfaudler Company, 1000 West Avenue, Rochester 4, N. Y.)

Check 2114 opposite last page.

**Molecular sieves**

Complete information on using "molecular sieve" adsorptive desiccants for drying gases is contained in manufacturer's 20-page bulletin. Tables and charts provide engineering data for preliminary designs of low-dewpoint drying systems. Bul F-1026 — Linde Co., Div. of Union Carbide Corp., 30 E. 42nd St., New York 17, N.Y.

Check 2115 opposite last page.

**Stainless heat exchanger designed for 600 psi, 650°F service**

Fabricated entirely from 321 Stainless

Unusual heat exchanger was recently completed for installation in British oil refinery. Fabricated entirely of type 321 Stainless Steel, unit is designed to withstand op-

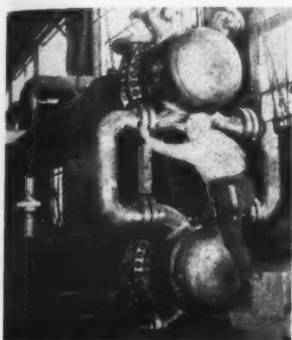
Check 2113 opposite last page.



## PROCESSING

erating conditions above 600 psig and 650°F on shell and tube sides.

Each U-type tube bundle shell is 29" I.D. Tubes were expanded into grooved tube sheets, rolled for full length of tube sheet, and seal welded by means of inert gas tung-



Heat exchanger will be installed in oil refinery in England

sten arc welding. All welds were ground smooth and flush, radiographed, and die-penetrant tested.

Tube sealing was hydrostatically tested, and then checked for leaks using ammonia-sulfur dioxide detection method.

(Stainless steel exchanger unit was fabricated by The M. W. Kellogg Co., subsidiary of Pullman Inc., 711 Third Ave., New York 17, N.Y.)

Check 2116 opposite last page.



"... then drink a glass of hot Elderberry wine and rub your chest with goose grease!"

Thanks to George E. Pokarek, The Glidden Company.

## Sam Spinner's Mail Box



by Sam Spinner

**Case #1:** How can we dry several large bulky items at one time?

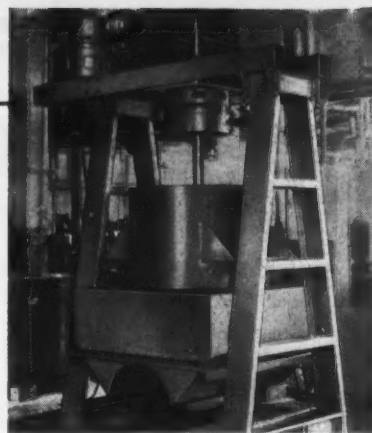
**Solution:** A T & M Engineers developed a huge Link Type Extractor which would handle loads of several thousand pounds, and also keep power requirements to a minimum.

**Case #2:** Our Parts Production Line has a bottleneck. Due to the shape of some of our parts, we are unable to handle or unload them in a conventional parts drier. What can you do for us?

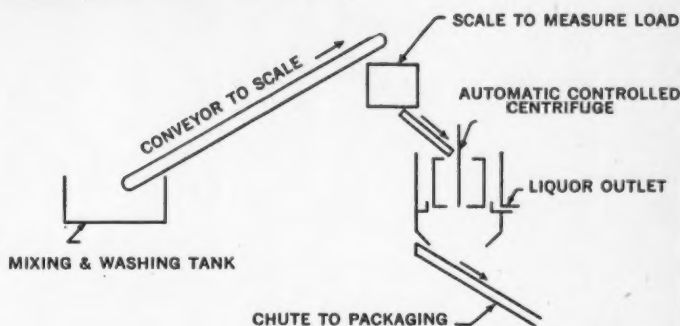
**Solution:** A Bottom Discharge Machine was developed which not only handles the troublesome parts, but also makes it possible to control entire operation automatically.

**Case #3:** We have a problem of throwing off excess coating after a hot dip, and are unable to clean unit as easily and fast as we require.

**Solution:** A special machine was developed to give extra fast acceleration to remove excess coating before solidification. Housing unit was made to open wide to facilitate cleaning in a very short period.



FLOW CHART shows automatic handling of bulk solids in an AT&M centrifugal. Solids are treated more gently than when operators did the material handling.



## Solids separated gently ... and automatically

Many "special" chemical processing problems find the one best answer in centrifuging engineered by AT&M experts.

Here liquids are to be separated from the solids... but the solids must be treated gently. AT & M engineered this machine that handles the products without the use of bags. It carefully loads into the basket through AT & M's slow-speed loading drive. After extraction, the basket is unloaded onto a conveyor by a new type bottom discharge basket without the use of a plow. The whole cycle is performed automatically without need of an attendant.

New AT & M models make maximum use of time and space, with top safety. Send coupon for data.

AMERICAN TOOL & MACHINE COMPANY  
1423 Hyde Park Ave., Boston 36, Mass.

Please send me my free copy of the new AT&M booklet "Centrifugal Force." I am interested in the following processes:

Separation ☐ Extraction ☐ Dehydration ☐ Clarification ☐  
Coating ☐ Filtration ☐ Draining ☐ Thickening ☐ Impregnation ☐  
Sedimentation ☐

SAVE TIME, SPACE  
AND COSTS WITH

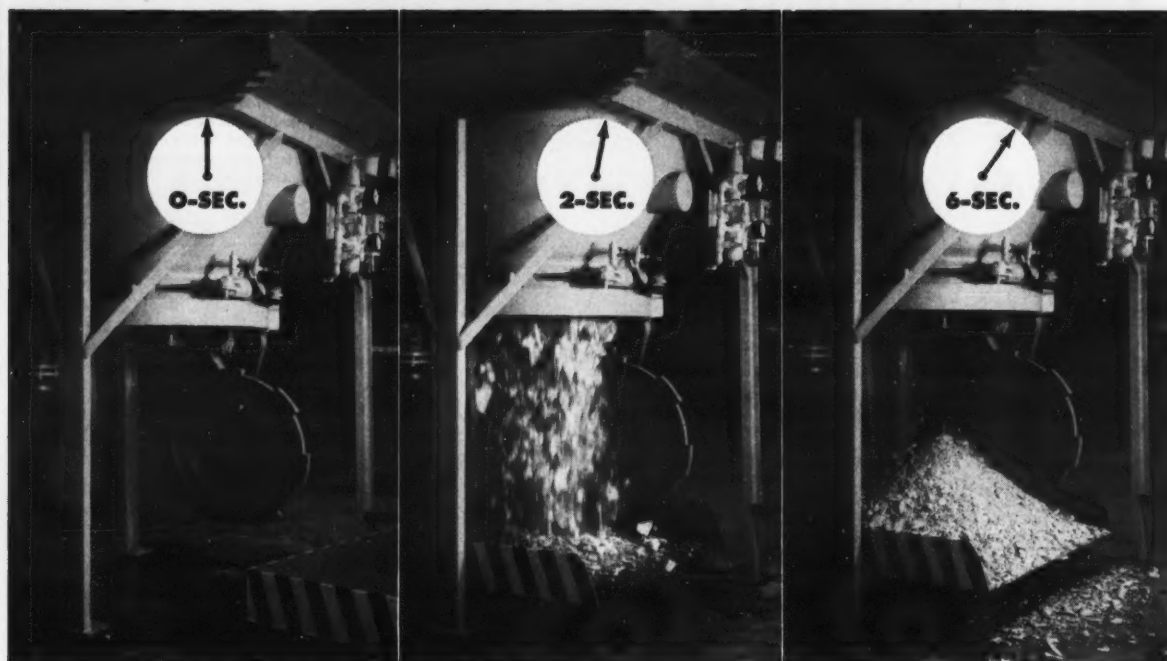
**A.T. and M.**  
CENTRIFUGING

Name.....Title.....  
Company.....  
Street.....  
City.....Zone.....State.....



Check 2117 opposite last page.

# Here's what MODERN FILTERS can do!



**Just flip the lid...WHAM...cake removed in seconds**

It's just as easy as that... why put up with costly downtime and messy operations when Industrial has the answer to **rapid thorough cleaning in seconds**. Industrial's new Vertical, Bottom Outlet, Type "152" Filter offers tremendous advantage in removing and subsequent disposing of waste materials.

Industrial's quick opening bottom drop door is the **fastest available method for removing large volumes of solids in a dry form or slurry**, depending on the customer's wishes. When necessary...the cake can be leached before removal from the filter to recover valuable salts, sugars or other constituents.

Industrial's rapid cleaning features can definitely **reduce downtime costs** for either continuous or batch type operations.

**See this filter in action... Stop at Industrial's display at the 26th Exposition of Chemical Industries, New York Coliseum, Dec. 2-6, 1957**  
Booth No. 1188 to 1273

## INDUSTRIAL

FOR ADDITIONAL INFORMATION WRITE...

**INDUSTRIAL FILTER & PUMP MFG. CO.**  
5908 OGDEN AVENUE • CHICAGO 50, ILLINOIS

Check 2118 opposite last page.

## PROCESSING

**Polyethylene filter cloth has 50,000 to 100,000 psi tensile strength**

Good chemical resistance, can be sterilized at 250°F

**Uses:** Filtering various materials in chemical, pharmaceutical, food, and allied industries.

**Features:** Filter cloth is made from high density polyethylene. Tensile strength is in range of 50,000 to 100,000 psi and elongation ranges from 5 to 10%. Material has good chemical resistance.

**Description:** Polymax filter cloth is manufactured from the new olefin polymers known as high density, linear, low pressure, or high crystallinity polyethylene.

Softening temperature is 260°F. Material can be sterilized at 250°F. Exposure at 230 to 240°F results in only minimum shrinkage.

Product is available either in form of roll goods or sewn filter elements.

(Polymax filter cloth is product of The National Filter Media Corp., 1717 Dixwell Ave., New Haven, Conn.)

Check 2119 opposite last page.

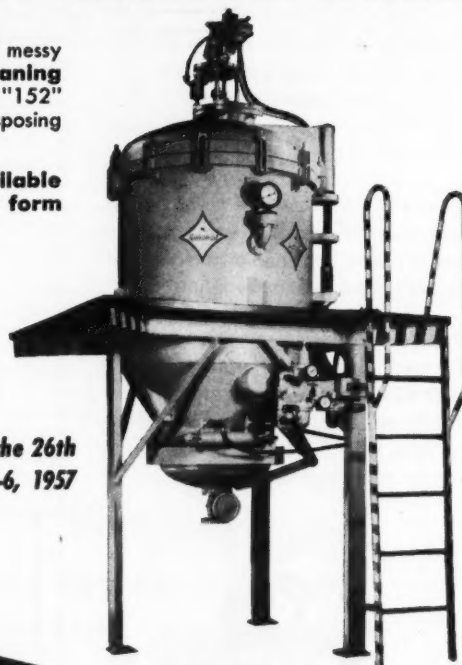
**Huge magnetic separator handles 32,000 lb feed per hour**

Flux intensity of every rotor can be individually adjusted

Reported to be one of world's largest, high intensity magnetic separator creates 176,000 magnetic lines of force per sq in, at maximum flux. This results in a total of 57 million lines of force available for separation in the 16-rotor machine.

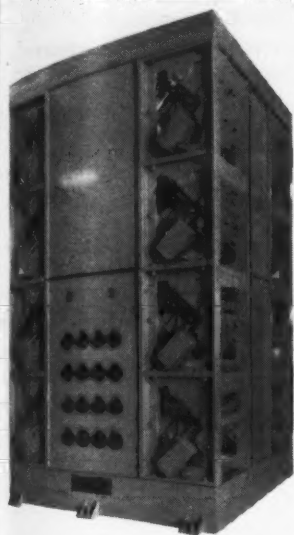
The induced roll magnetic separator is one of the most flexible and completely automatic separators in service, according to manufacturer. Feed rates from 8000 to 32,000 lb per hour can be handled by the 16-rotor machine.

Unit may be set up to give any combination of flow of material, such as repassing



CHEMICAL PROCESSING

## PROCESSING



Separator creates 176,000 magnetic lines of force per sq in

either magnetic or non-magnetic products.

Flux intensity of every rotor may be individually adjusted electrically.

Automatic controls stop and start feed to machine, and provide shut-off in case of power failure.

(High intensity magnetic separator is product of Carpc Co Mfg., Inc., Dept. CP, PO Box 3272, Jacksonville 6, Fla.)

Check 2120 opposite last page.

### FOR MORE INFORMATION

Here's what to do when you want additional details about products and services mentioned in this issue's editorial articles or advertisements.

Note the number at end of article or advertisement. Check this key number on Reader Service Slip opposite last page of this issue. Fill in Slip with the other pertinent information (name, title, company, address, product made). Mail to our Reader Service Department.

We'll contact the manufacturer for you. He'll send you the details direct.

87 OF AMERICA'S "FIRST HUNDRED" CORPORATIONS  
ARE WHITING CUSTOMERS

processors create  
new products...  
new markets...  
new profits  
with Swenson spray  
drying methods

Swenson Spray Dryer tests products  
on a production-run basis

Many companies have determined the practicality of spray drying for their product in the full-sized Swenson Spray Dryer shown at right. Such a test, conducted in the Swenson Laboratory at Harvey, provides the complete data of a full-scale production run, and provides the assurance of product acceptability before a major investment is made. With these figures available, Swenson Engineers work with the company engineering staff on layout and design.

Spray drying is the fastest, and in many cases the most economical drying method used commercially. Drying action is almost instantaneous and uniformity of product usually eliminates the need for additional processing steps. You can determine the profitability of spray drying your product in the Swenson Laboratory.

This Swenson Spray  
Dryer is in operation  
of a large pharmaceutical house.

14

## Looking for ideas that build profits?

"Working for Profit", a new pocket-size booklet, shows how many processing companies simplify production, improve products and cut handling costs with Swenson and Whiting equipment. Shown above is just one of several pages giving a quick review of Swenson Evaporators and Spray Dryers for efficient, economical processing of chemicals and foods. The booklet describes plant-scale tests which can be made on your product.

These tests provide the assurance of product acceptability before a major investment is made. There's other helpful information on Whiting Cranes, Trackmobiles and every Whiting product used in your type of industry. Here are 32 pages of profit-building ideas, indexed for your convenience. Write for your copy. Swenson Evaporator Company, 15667 Lathrop Avenue, Harvey, Illinois.



# SWENSON

Proved Engineering for the Process Industries

Since 1889



Check 2121 opposite last page.





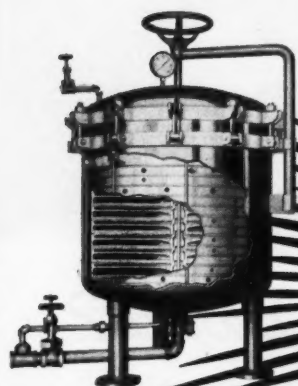
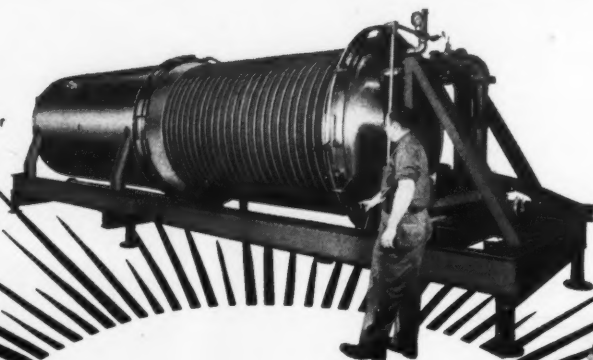
We're looking  
for you at...

**BOOTH 56**



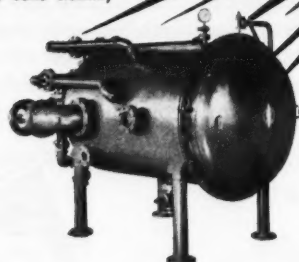
**CHEMICAL SHOW ... New York ... DEC. 2-6**

**Model MCR**  
With Speed-Lock Cover  
Heavy Duty

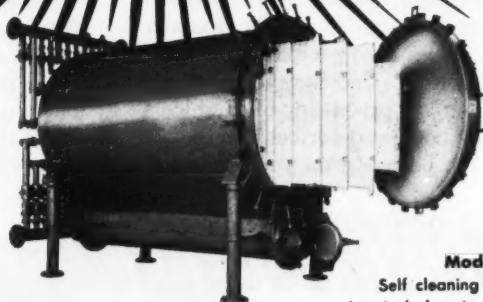


**Horizontal Plate Filter**  
positive cake stability

**SPARKLER  
FILTERS**



**Model SCJ**  
Heavy duty water filter



**Model RSC**  
Self cleaning without opening  
(particularly suited for toxic products)



**Model VR**  
Disc plate trap filter

**See these filters at the show**

**SPARKLER MANUFACTURING COMPANY, Mundelein, Illinois**

FILTRATION ENGINEERING AND MANUFACTURING FOR OVER 30 YEARS.

Check 2122 opposite last page.

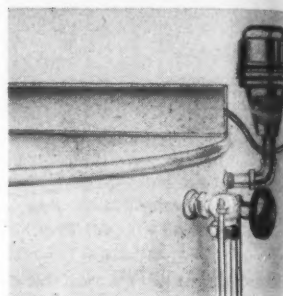
## PROCESSING

### Distilled water kept sterile with ultra-violet lighted storage tank

**Uses:** For storing distilled water and sterile solutions.

**Features:** Ultra-violet light maintains sterility of solutions being stored.

**Description:** Ultra-violet light is set at special frequency and is mounted above surface of water in tank.



Ultra-violet light in tank maintains sterility of stored solutions

Tanks are available in capacities ranging from 5 to 1000 gal, including vertical-cylindrical and box-type tanks.

(Ultra-violet lighted tank is product of Barnstead Still & Sterilizer Co., Lanesville Terrace, Boston 31, Mass.)

Check 2123 opposite last page.

### Top heat efficiency given by packaged electric heat transfer system

Can use Dowtherm, Aroclor or other heating oils

**Uses:** Heating processing and other equipment in chemical and allied industries.

**Features:** Packaged heating units are designed to maintain low rate of heat input and high velocity of heat transfer medium. Dowtherm, Aroclor, or other liquids may be used.

**Description:** Packaged unit consists of one or more tubes heated by electrical heating elements. Tubes are made in standard 5 and 10 ft lengths. Oil makes two passes in each heating tube. Heating elements are available with 6 and 12 kilowatt capacities.

Unit incl  
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Check 21

## Felt filter

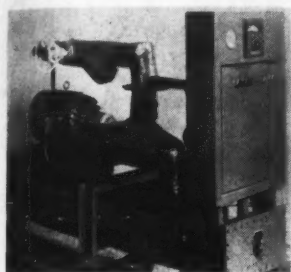
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Check 21

## PROCESSING

Unit includes positive displacement pump, motor, piping, and control accessories. Tubes are mounted in horizontal position so that in a 6-tube unit the heating oil makes 12 passes around heating elements.

All electrical connections and controls for heating elements are accessible at one end of tube. Elements can be removed without disturbing piping containing heating oil



Packaged heating system comes complete with pump, motor, piping, and control accessories

and without draining system. If heat load should decrease, one or more of the elements can be disconnected without disturbing other parts of unit.

A portable unit has been installed at Budd Company, in Philadelphia, to heat cast steel molds for molding plastic rings. Mounted on wheels, unit can be moved to serve a number of molding presses. Heater has capacity of 30 kw and keeps molds at 400-450°F. A light oil is used as heat transfer medium. Unit measures 7' 1 x 3' w x 4 1/2' h.

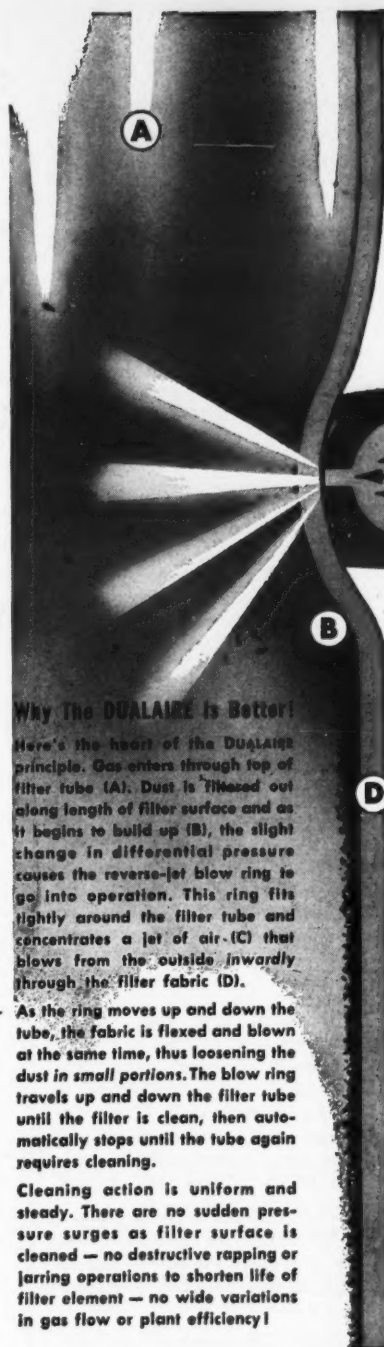
(Hynes packaged heaters are product of Hynes Electric Heating Div., Turbine Equipment Co., Mountainside, N.J.)

Check 2124 opposite last page.

### Felt filter elements

Bulletin outlines advantages of felt filter elements formed into sheets, discs, strips, tubes, and other shapes by new impregnating and shaping process. Bul F-101—The McIntire Co., Okner Parkway, Livingston, New Jersey.

Check 2125 opposite last page.



### Why The DUALAIRE is Better!

Here's the heart of the DUALAIRE principle. Gas enters through top of filter tube (A). Dust is filtered out along length of filter surface and as it begins to build up (B), the slight change in differential pressure causes the reverse-jet blow ring to go into operation. This ring fits tightly around the filter tube and concentrates a jet of air (C) that blows from the outside inwardly through the filter fabric (D).

As the ring moves up and down the tube, the fabric is flexed and blown at the same time, thus loosening the dust in small portions. The blow ring travels up and down the filter tube until the filter is clean, then automatically stops until the tube again requires cleaning.

Cleaning action is uniform and steady. There are no sudden pressure surges as filter surface is cleaned — no destructive rapping or jarring operations to shorten life of filter element — no wide variations in gas flow or plant efficiency!

There are many other advantages built into the DUALAIRE. For further details send for descriptive 8 page booklet. Or contact your nearest Western Precipitation representative!



COTTRELL Electrical Precipitators  
MULTICLONE Mechanical Collectors  
CMP Combination Units  
DUALAIRE Reverse-Jet Filters  
HOLO-FLITE Processors  
HI-TURBIANT Heaters

If you use filter systems...

## CHECK THESE MULTIPLE ADVANTAGES

## OF THE REVOLUTIONARY *JET-CLEANED*

# Dualaire\*



## DUST COLLECTOR!

No pressure surges!

No filter choking!

Efficiencies up to 99.99%!

If you use bag-houses or other similar collecting systems in your plant operations, be sure to investigate the many vital advantages built into Western Precipitation's new DUALAIRE Dust Collectors. Backed by the same well-known organization that pioneered commercial application of COTTRELL Electrical Precipitators and MULTICLONE Mechanical Collectors, DUALAIRES bring entirely new performance and efficiency standards to filter-type collection systems.

As outlined at the left, heart of the DUALAIRE is a jet-cleaning blow ring that travels up and down the cloth filter tube, keeping it clean without the alternate choking and pressure surges characteristic of conventional rapping, vibrating, or jarring systems of cleaning off the collected dust.

### Result —

► **UNIFORMLY LOW PRESSURE DROP** is assured, because the collected dust is removed steadily and in small increments — not by sudden surges!

► **UNIFORMLY HIGH EFFICIENCIES** — as high as 99.99% under actual field conditions — are maintained by the constantly-cleaned filter surfaces. There is no "choking" action — no variation in filter capacity as dust accumulates!

► **LONGER FILTER LIFE** is obtained because the filter fabric is not subjected to destructive jarring, rapping and vibration of conventional filter cleaning methods. The Dualaire cleaning action is gentle — yet far more effective!

► **LESS EQUIPMENT IS REQUIRED** to handle a given capacity with the Dualaire because no standby sections need be provided for gas cleaning while other sections are shut off for rapping.

The Dualaire filter is kept constantly clean — automatically — while it is filtering out the suspensions. The gas is filtered and the dust removed simultaneously — without interruption. Saves space, simplifies installation!

► **MAXIMUM ADAPTABILITY** to varying installation requirements is assured by the "sectionalized" design of the Dualaire. Each section is available in 5 different heights — and as many sections can be bolted together as desired to meet plant requirements. As needs increase, simply add more sections!

► **EFFICIENT STRAIGHT-THRU DESIGN** of filter tubes assures easier dust recovery, better flow. Dirty gas enters top of tube, is filtered through the walls, and dust drops by gravity through bottom of tube into collection chamber. Separated material does not re-entrain in the gas flow



## WESTERN

# PRECIPITATION CORPORATION

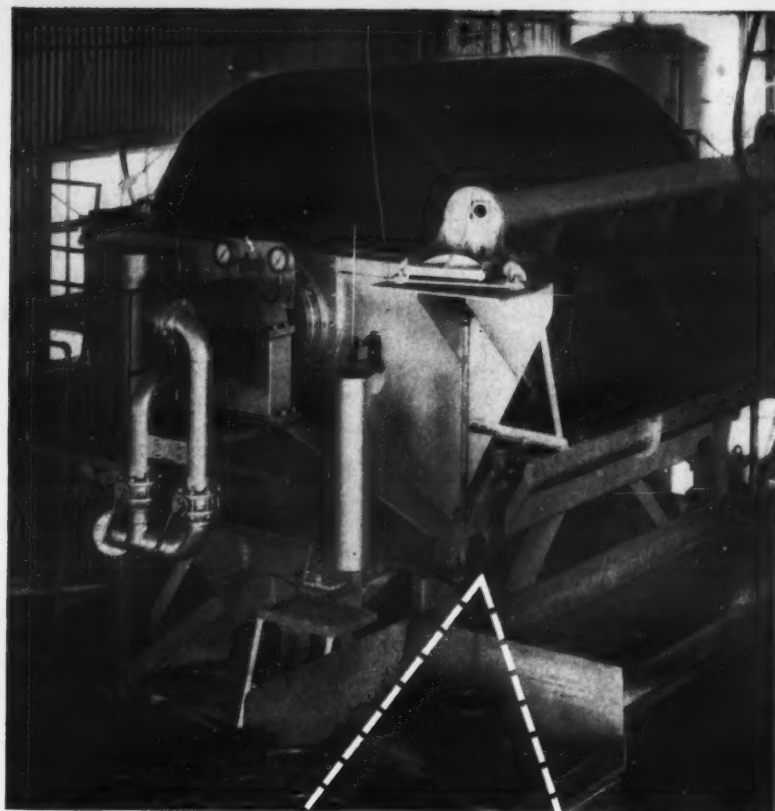
Engineers and Constructors of Equipment for Collection of Suspended Material from Gases . . . and Equipment for the Process Industries  
LOS ANGELES 54 • NEW YORK 17 • CHICAGO 2 • PITTSBURGH 22 • ATLANTA 5 • SAN FRANCISCO 4

Representatives in all principal cities

Precipitation Company of Canada Ltd., Dominion Square Bldg., Montreal

Check 2126 opposite last page.





How Barnett Laboratories Inc.

Recovers Carotene with

## Oliver Precoat Filter...

Installed at Barnett Laboratories Inc., Long Beach, California plant, this Oliver Precoat Filter is recovering carotene, a natural food coloring substance, from carrot juice. The Filter is 8' dia. by 8' face, constructed of stainless steel.

The present installation is the culmination of several years of close cooperation between Barnett and D-O engineers. Initially, an Oliver Pilot Plant unit was rented for investigating the feasibility of the process. Next, a somewhat larger Oliver was purchased and operated on a semi-works basis. And finally, the present full scale unit was installed for capacity production. This Oliver Precoat has now been operating for over two years and closely approximates the scaled up pilot plant figures.

For the Food Industries, Dorr-Oliver manufactures a complete line of wet processing equipment. If you have a filtration problem, or one involving clarification, centrifuging or waste treatment, just drop a line to Dorr-Oliver Incorporated, Stamford, Conn. No obligation, of course.



Check 2127 opposite last page.

## PROCESSING

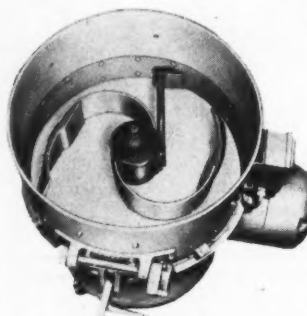
**'Rubbing action' in mixer produces uniformly blended mixtures**

Does not heat or crush material

**Uses:** Blending wide variety of granular materials.

**Features:** Contour of spring arms causes fast "rubbing action" which does not heat or crush material and produces thoroughly blended mixture.

**Description:** Flexible, spring-steel arms whirling against walls provide mixing motion. Arm action causes material to move upwards as it is being squeezed, until it



Flexible, spring-steel arms provide mixing action

falls back into pan to go through next mixing cycle.

Totally-enclosed, 5-hp motor is directly connected to gear reduction unit. Mixer requires little space, needs no foundation, and is easily moved. Available with capacities of 1 1/4 to 8 cu ft.

("Whirlmix" is manufactured by Federal Foundry Supply Co., 4606 E. 71st St., Cleveland 5, Ohio.)

Check 2128 opposite last page.

## Discusses mixers

Bulletin of eight pages describes manufacturer's double-arm, spiral-ribbon, and vertical mixers suitable for laboratory, pilot plant, or for commercial production. Bul 1483—Read Standard Div., Capitol Products Corp., York, Pennsylvania.

Check 2129 opposite last page.

## CLEAN\* SEPARATION

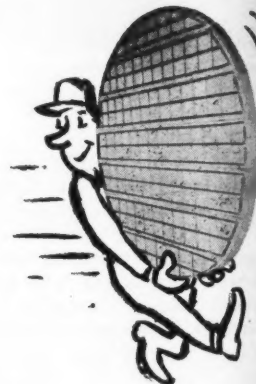
\*99.9% plus with

**YORKMESH DEMISTERS**  
(MIST EUMINATORS, ENTRAINMENT SEPARATORS)

**YOU present your problems...**



**YORK will recommend and deliver the answer...**



Why not take advantage of our vast experience in improving the performance of process equipment. In the past 10 years, the outstanding success of thousands of installations is proof of the superiority of YORKMESH DEMISTERS for entrainment control.

Yorkmesh Demisters are used to improve product quality, to avoid losses, and to increase throughput capacity. Our engineers will give careful consideration to the information you submit and will recommend the best answer to your problem.

**YORKMESH DEMISTERS**  
improve the performance of:

Vacuum Towers • Distillation Equipment • Gas Absorbers • Scrubbers • Evaporators • Knock-out Drums • Steam Drums



**OTTO H. YORK CO., INC.**  
6 CENTRAL AVE. • WEST ORANGE, N.J.

Check 2130 opposite last page.  
CHEMICAL PROCESSING



## PROCESSING

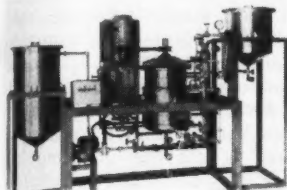
### Continuous fermenter operates automatically

Units are available in 20 liter to 2000 gallon capacities

Uses: Continuous fermentation.

Features: Flexibility of clearance between aeration wheel and draft tube, adjustable baffles, etc., permits continuous automatic operation where critical tolerances must be maintained.

Description: The Waldhof-type continuous fermenter is said to be the first American unit of this type. It uses process widely used in Germany



Continuous fermenter has feeding tank, fermentation vat, and receiving tank, all made of stainless steel

and other countries. Process is particularly adaptable for conversion of whey to yeast, sewage disposal, processes for aerobic production or organisms, production of baker's yeast, and similar fermentations.

Fermenter has stainless steel feeding tank, fermentation vat, and receiving tank. Units are available in 20 liter to 2000 gallon capacities.

(Waldhof-type continuous fermenter is product of Stainless & Steel Products Co., 1000 Berry Ave., St. Paul 14, Minn.)

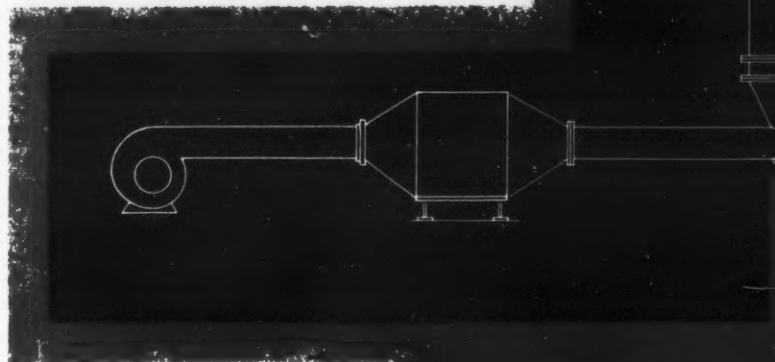
Check 2131 opposite last page.

### Describes filter fabric

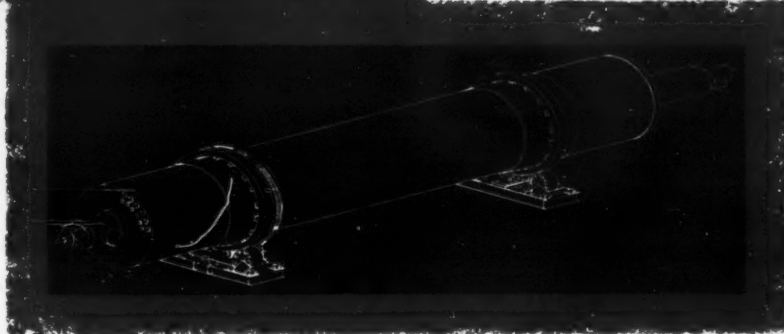
Napped spun Orlon filter fabric is described in two-page bulletin. Features, characteristics, and laboratory test data are listed. Sample of cloth is attached. "Feon 408" Bul — Filtration Fabrics Div., Filtration Engineers, Inc., 155 Oraton St., Newark 4, N. J.

Check 2132 opposite last page.

### Continuous Atmospheric Rotary Dryer



### Continuous Fluidized Bed Dryer



### Continuous Solvent Stripper Continuous Gas Solids Reactor Continuous Vacuum Dryer

**Now, at one convenient location, you can test-dry your materials in a variety of equipment**

At General American's East Chicago pilot plant, you can test the drying or reacting of your materials in the widest range of drying equipment ever assembled in one place.

Louisville Dryer engineers will work with you—study your materials and needs, make recommendations for type of equipment, size and heating medium. You can check these recommendations for yourself through practical tests. Your Louisville Dryer is then engineered for most efficient and economical service—built specifically to meet your needs.

To test the drying of your materials in all these different types of drying equipment, call in a Louisville Dryer engineer. There is no cost or obligation.

See us at the "Chem Show" Booths 436, 442 and 446



### LOUISVILLE DRYING MACHINERY UNIT

### GENERAL AMERICAN TRANSPORTATION CORPORATION

Dryer Sales Office: 139 S. Fourth Street, Louisville 2, Kentucky • Eastern Sales Office: 380 Madison Avenue, New York 17, New York • In Canada: Canadian Locomotive Company, Ltd., Kingston, Ontario, Canada

General Offices: 135 South La Salle Street, Chicago 90, Illinois.

Check 2133 opposite last page.

*a series about*  
**PROCTOR SERVICES**  
*for your new products*



Mr. Albert G. Blank  
 Sales Manager  
 Process Industries Sales

**No. 5: your needs and  
 Proctor's sales service**

Satisfaction of your needs is the ultimate aim of Proctor's sales service.

In the preliminary aspects of a drying problem your basic requirements have been reviewed and are incorporated into the preparation of a proposal for your consideration. It is important that there be a check point in the development of a proposal so that a mutual interpretation of the needs and the satisfaction of these needs by equipment recommended can be determined.

In this phase of progress of the job, Proctor's sales service affords the means of analyzing the accumulated data on the job.

Through a mutual review of the whole problem, it is finalized in all respects and it is then ready for the action of purchase of equipment.

In this manner nothing is left to chance; the job has been thoroughly explored and you can purchase with confidence.

Proctor guarantees satisfaction for your profit and we'd like to show you what Proctor's sales service means to you the next time you plan a dryer installation.



**PROCTOR & SCHWARTZ, INC.**  
 PHILADELPHIA 20, PA.

**PROCESSING**

**Mixing equipment**

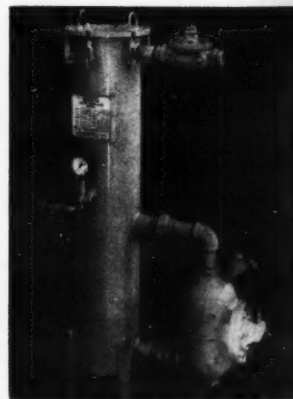
Manufacturer's line of blenders, mixers, sifters, and roll mills is described and illustrated in four-page bulletin. Design features and specification tables are included. Bul 557 — The J. H. Day Co., Div. of Cleveland Automatic Machine Co., Cincinnati 12, Ohio. Check 2135 opposite last page.

**Filter-separator removes water, 5-micron particles from solvents, oils**

Has replaceable cartridge

**Uses:** Removing water, solids, and water-borne contaminants from solvents, oils, fuels, and other oleaginous liquids.

**Features:** Filter-separator can handle from 5 to 40 gpm and is capable of removing particles down to 5 microns in size. Unit extracts all undissolved water from hydrocarbon liquids. It is reported to be simplest and least expensive of such devices available to date.



Unit stands 54" high and occupies only one sq ft of floor space

**Description:** Filter-separator stands 54" high and occupies only one sq ft floor space. Unit's replaceable cartridge is one-inch-thick wrapping of resin-bonded glass fiber on expanded metal. Its life is not affected by the quantity of separated water and is limited only by amount and type of solid materials filtered.

Check 2134 opposite last page.

**CHEMICAL PROCESSING**

Rated at  
 handle light  
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 to 25 gpm  
 fuels at 10  
 Maximum  
 is 150 psi.  
 is only a  
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 Richmond

Check 213

**Processing**

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 Equipment  
 Denver 17

Check 213



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Thanks to  
 E. I. du  
 Inc., Wilm

NOVEM

# HIGHLY INTIMATE BLENDS IN 1 TO 2 MINUTES

## Sturtevant blending continues during discharge - no segregation or flotation

Rated at 15 gpm, unit will handle light fuels like gasoline at from 30 to 40 gpm, kerosenes and jet fuels at 20 to 25 gpm, and heavy diesel fuels at 10 gpm.

Maximum working pressure is 150 psi. Initial pressure drop is only about one psi. A gage measuring pressure drop across cartridge gives visual indication of need for cartridge replacement.

Units removing water as chief contaminant, are provided with knockdown shroud around separator cartridge. Automatic controls handle continuous discharge of separated water and prevent sludge from working up into clean product outlet.

(Reco model SV-11 and SV-11A filter-separators are products of Filter Products Div., Richmond Engineering Co., Inc., Seventh & Hospital Sts., Richmond 5, Va.)

Check 2136 opposite last page.

### Processing equipment

Bulletin of eight pages shows company's latest equipment for chemical processing, including mills, agitators, filters, classifiers, pumps, etc. Laboratory testing and development services are also described. Bul G3-B60 — Denver Equipment Co., PO Box 5268, Denver 17, Colo.

Check 2137 opposite last page.



"How are you making out with the new lab assistant?"

Thanks to Joseph C. Dilts, Film Dept., E. I. du Pont de Nemours & Co., Inc., Wilmington, Delaware

Sturtevant's unique 4-way blending action begins during charging phase — continues during discharge phase. Thus highly intimate blends often are produced within 1 to 2 minutes. A complete blending cycle — from start of charging to completion of discharge — may be accomplished within 3 to 5 minutes.

Sturtevant's special action produces no particle reduction, cleavage or attritional heat — is highly effective yet gentle and safe even with explosives.

### Self-cleaning, dust-sealed drum; fast, one-man accessibility

Operation of Sturtevant Blenders is completely dust-sealed; special design of stuffing box fully seals against leakage. For inspection of all models, one man simply loosens a few lugs to remove manhole cover — quickly and easily.

#### Receiving



Scoops cascade material as drum rotates. Movement forces material from both ends to middle. Thus blending is 4-way — circular, vertical and two lateral.

#### Discharging

Single gate controls charge, discharge. Blending continues throughout discharge phase. Result is no segregation or flotation — highly intimate, even blends.

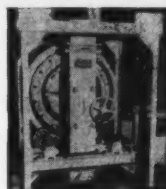


### Nine standard models with capacities to 900 cu. ft.

Pilot plant blending to largest production runs are handled by standard models of Sturtevant Blenders with capacities from 10 cu. ft. to 900 cu. ft. Rotary drum design is a proven space-saver, including headroom. Write for Bulletin No. 080B giving complete specifications.

#### Sectional view of Sturtevant Blender

'A' (solid line) shows swinging chute in blending position; 'B' (solid line) shows gate closed for blending. 'A' (dotted line) shows swinging chute in discharging position; 'B' (dotted line) shows gate open for discharging.



10 cu. ft. Sturtevant Blender at U.S. Steel Corp.'s new Applied Research Laboratory (Raw Materials Division) in Monroeville, Pa. This unit handles batches up to 500 lbs. — is ideal for pilot work and small runs.



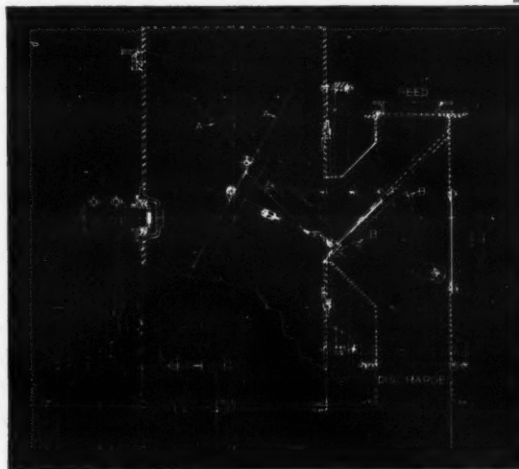
One of four 450 cu. ft. Sturtevant Blenders at Celriver Plant of Celanese Corp. (Rock Hill, N.C.). These large units handle up to 20,000 lbs. batches — have a 9-year record of meeting the most exacting blending requirements.

### Fully or semi-automatic, or manually controlled operation

Constructed of carbon steel, stainless steel or Monel metal, Sturtevant Rotary Blenders are engineered to fit each customer's needs — can be supplied with injector sprays and any desired control system.

For more on Sturtevant Blenders, request Bulletin No. 080B. (See coupon for available bulletins on other Sturtevant machinery.) Write today.

STURTEVANT MILL CO.



See Us at the Chem Show — Booth 421

Check 2138 opposite last page.

My dry-process materials are:

Desired capacity is:

Name

Firm

Street

City

Title

State

Zone

STURTEVANT MILL COMPANY, 119 Clayton Street, Boston 22, Mass.

Please send me your bulletin on Blenders

Also bulletins on machines for:

☐ CRUSHING

☐ GRINDING

☐ PULVERIZING

☐ MICRON-GRINDING

☐ AIR SEPARATING

☐ MIXING

☐ SCREENING

☐ GRANULATING

☐ CONVEYING



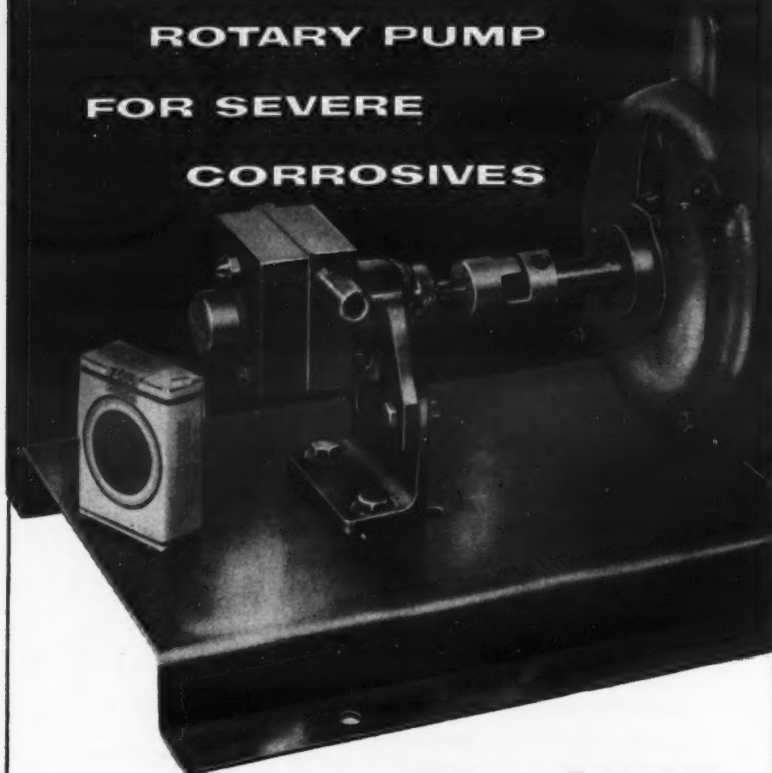
# NEW

## "MINILAB"

### ROTARY PUMP

### FOR SEVERE

### CORROSIVES



**ONLY \$200**

**FOR HASTELLOY C AND  
TEFLON CONSTRUCTION**

For applications from 0 to 2 gpm, here is a self-priming pump designed for the most severe corrosive service in laboratory and pilot plant installations. Because of rugged construction, "Minilab" pumps can be used around-the-clock.

Internal, self-lubricating Teflon bearings eliminate all problems of product contamination. In addition, the pump can be steam and chemically sterilized. Yielding a linear flow, ideal for constant-flow metering, the unit is reversible and may be staged for higher pressures.

Send for complete specifications and pump curves.

Hastelloy — trademark of Union Carbide Corp.

Teflon — trademark of E. I. duPont

see ECO'S complete line at the **CHEMICAL SHOW**

# ECO

*The big name in small pumps*

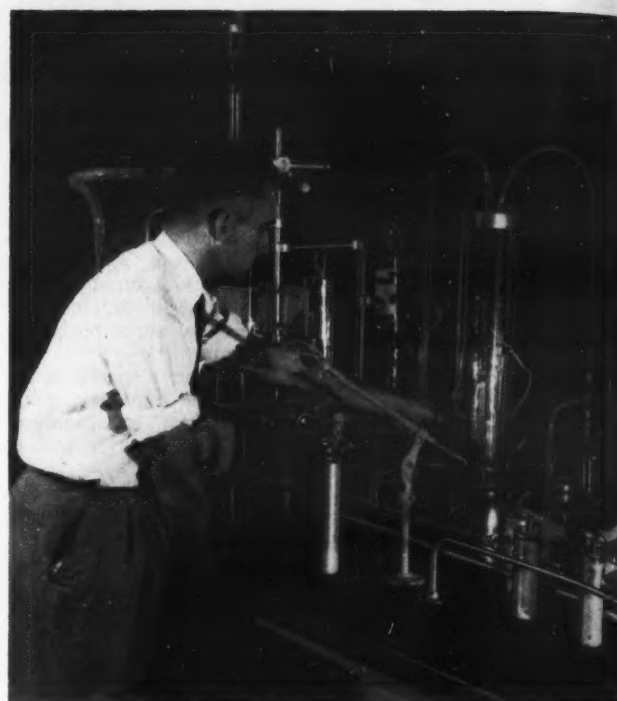
**ENGINEERING COMPANY**

**12 NEW YORK AVE., NEWARK 1, N.J.  
Market 4-6565**

Check 2139 opposite last page.



**FOR THE  
LABORATORY**



Typical gas-and-metal determination takes less than 10 minutes. Dr. Fred A. Achey, of Serfass Corporation, makes vacuum-fusion analysis for traces of hydrogen and titanium. Time: 9.5 minutes

**Development of vacuum-fusion analyzer  
with palladium diffuser means —**

## A fast, easy way to measure gases in metals

**Uses:** With introduction of recently-developed gas analyzer, metals industry has a quick, fast, accurate way to measure traces of hydrogen, oxygen, and nitrogen in its materials, *right in the middle of a "melt."*

Already, apparatus is being used to determine gases in titanium, nickel, manganese, niobium, vanadium, zirconium, and other metals.

**Features:** Gas analyzer can be used for both vacuum fusion and extraction. In addition, instrument has been made sufficiently rugged and "fool-proof" that it can be

moved from laboratory onto floor of the plant.

**Description:** Special palladium diffusion unit is secret to operation of gas analyzer. Palladium, at high temperatures, acts like a filter for hydrogen.

Mixture of gases evolved from sample is pumped into a bulb containing a thin-walled U-tube of palladium. Any hydrogen present passes through palladium to U-tube, and is pumped to a calibrated McLeod gage and measured. Other gases remain behind to be reported as nitrogen or removed for further analysis.

CHEMICAL PROCESSING

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Gases  
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mercury  
nace can  
sample c  
first is b  
ml cap  
passes g  
"lamp"

NOVE

The hydrogen separation usually takes no more than 30 seconds, gives results accurate to  $\pm 0.2$  ppm.

Auxiliary oxygen analyzer connects to analytical train through ground-glass ball-and-socket joint. Oxides in samples are converted to carbon monoxide by reaction with graphite in the furnace. Gas is further oxidized to carbon dioxide in a tube containing copper oxide, catalyzed by cerium oxide, absorbed, and change in volume measured.

Residue is usually reported as nitrogen.

#### Can Be Used For Both Fusion and Extraction

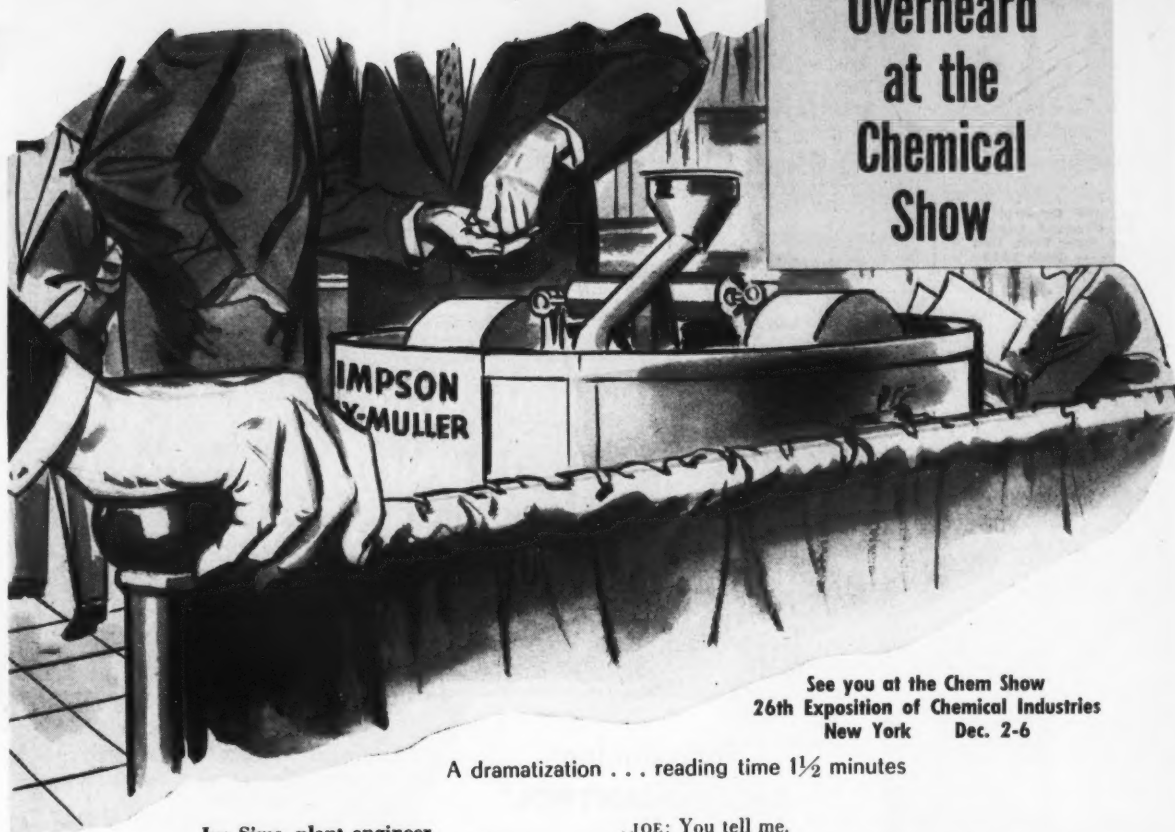
Vacuum-fusion furnace and extraction tube are interchangeable. Each is connected to analytical train through a cold trap and ball-and-socket joint.

Guldner-type hard-glass furnace contains a quartz crucible, suspended at axis of a water-cooled glass-insulated induction coil. Samples are introduced without breaking vacuum and can be run as long as there is room in the crucible.

Dropping the samples into the graphite inner crucible by means of a graphite funnel, operator watches fusion and checks temperature with an optical pyrometer through a pentaprism with a cobalt glass filter.

Extraction tube is mounted horizontally on aluminum blocks, in place of the furnace, and is heated by a smaller coil. Regulation is by same controls as furnace. Quartz tube has a hard-glass sample-inlet cap with window for observation. Furnace and other critical units are all shielded with a heavy, clear plastic.

Gases released from metal sample are transferred to analytical train by high-speed mercury diffusion pump. Furnace can be isolated so a new sample can be prepared while first is being analyzed. A 500-ml capacity Toepler pump passes gas into the palladium "lamp" where hydrogen is



See you at the Chem Show  
26th Exposition of Chemical Industries  
New York Dec. 2-6

A dramatization . . . reading time 1½ minutes

Joe Sims, plant engineer,  
wasn't as idly curious as he sounded  
when I overheard this conversation  
at a recent trade show:

JOE: What're you grinding up there?

Answer: It's sawdust—but we don't grind anything here. We're "mulling" (*pouring the contents of an envelope into the mixer*). Watch this . . . (pause).

JOE: That was fast!

Answer: The Mix-Muller dispersed that green dye throughout the sawdust in less than 2 minutes. Call the dye a binder or a reagent and you can better understand why a smearing or rubbing action is essential where dry materials must be mixed with relatively small quantities of liquids, semi solids or amorphous solids.

JOE: You tell me.

Answer: OK, if I stirred the dye in with a stick or paddle we would have a pepper and salt effect. The elements would be next to each other but not blended. It takes the folding of the Mix-Muller plow action, combined with a rubbing, kneading, muller action to give you an intimate, reacted if you will, blend of materials. Apply that to a product that must be extruded, cast, briquetted or wetted to a slurry and you can see why we say we sell controlled uniformity here.

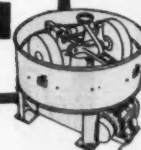
JOE: (*Later and aside to me*) You know, asking those Mix-Muller people what mulling is, is like putting a nickle in a juke box. They've got a whale of a story on mixing dry solids—I know . . . we've got five of them in our plant. I reconfirm this story every time I come to this show.

If you mix, and it's dry but not a powder, wet but not a liquid there's a whale of a story in this book for you. Write for "Mulling for the Chemical and Process Industry" today!



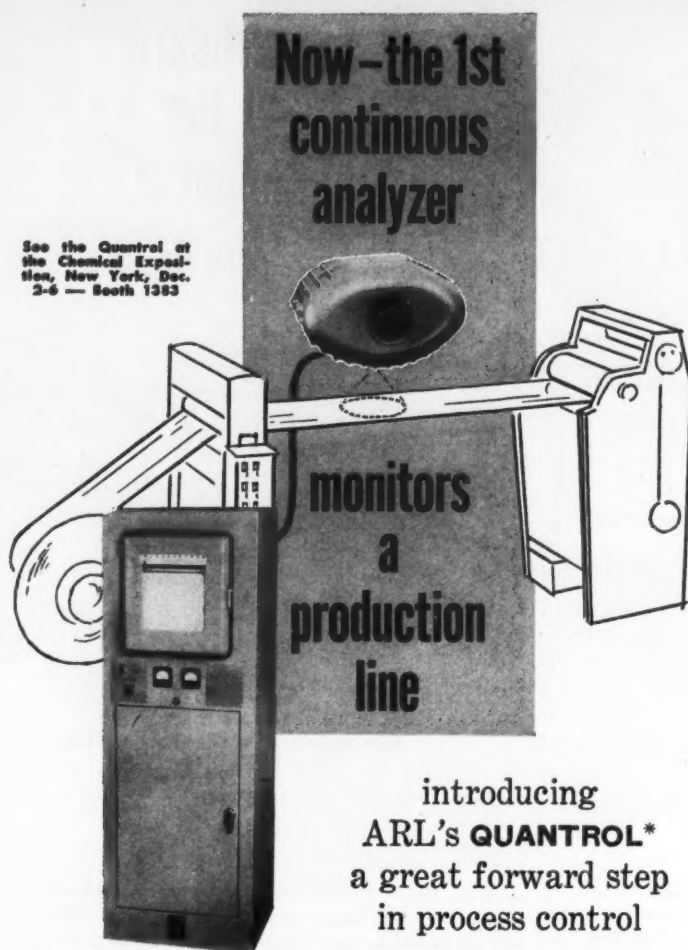
## SIMPSON MIX-MULLER® DIVISION

NATIONAL ENGINEERING CO., 640 Machinery Hall Bldg., Chicago 6, Ill.  
(Not Inc.)



Check 2140 opposite last page.

See the Quantrol at  
the Chemical Exposition,  
New York, Dec.  
2-6 — Booth 1383



The Quantrol, employing x-ray fluorescence, provides continuous, nondestructive analysis of any one of a large number of chemical elements. Working over an extremely wide range of concentrations, it is suitable for such diverse uses as continuously measuring tin and zinc coating weights on steel strip—uranium content in zirconium strip—zinc, copper, nickel, or iron content in ore tailings, concentrates, or slags—inorganic elements in process streams—heavier elements in glasses, cements, and pigments—sorting of parts by alloy type—thickness gaging of unusual materials. In fact, its application in process control is almost limitless.

The Quantrol is rugged and reliable, designed and built to operate on production lines. Process behavior is continuously recorded on the chart in units common to your industry. ARL's exclusive ratio technique cancels out many variables which limit the usefulness of other process controls.

ARL's New Systems Division will help you apply the Quantrol to your process and bring automation one step closer. Please write about your problem so that full information can be supplied by ARL's systems engineers.

\*TRADE MARK

**Applied Research Laboratories**  
SPECTROCHEMICAL EQUIPMENT  
3717 PARK PLACE • GLENDALE 8, CALIFORNIA  
NEW YORK • PITTSBURGH • DETROIT • CHICAGO • DALLAS • LOS ANGELES • LAUSANNE, Switzerland • LONDON, England

Check 2141 opposite last page.

## LABORATORY

removed and measured. If amount of gas is large, part can be diverted into one or both of a pair of calibrated reservoirs.

Costs Approximately \$11,500  
Completely Installed

Completely installed, the approximate cost of gas analyzer for hydrogen determination is \$11,500.

Auxiliary oxygen analyzer, which fits on same base, is another \$500.

Designed for ruggedness, base of apparatus is a double desk with a top of 1½" plastic-laminated plywood.

Vacuum-pumping system is self-contained unit with its own control panel, power switch, and monitoring gage.

Shielded 5-kilowatt, 500-kilocycle generator, both water and air-cooled, for the induction furnace is self-contained with its own control panel, automatically valved water lines, and plug-in electronic elements.

Instrument uses 3-wire 230-volt single phase, 60-cycle AC. All metal units are interconnected and grounded for safety.

(Serfass Gas Analyzer is product of Fisher Scientific Co., 717 Forbes St., Pittsburgh 19, Pennsylvania.)

Check 2142 opposite last page.

## Analyzes and records scintillation counter spectrums

Permanent record is made in minutes with Land camera

Uses: Analyzing and recording pulse spectrums from scintillation or proportional counters in isotope identification, purification, and tracer studies.

Features: Pulse analyzer records energy distribution curves photographically.

Permanent card-sized photo record of spectrum is available in minutes with Land camera.

Description: Analyzer can be used with one, two, or three

## MULTIPLE BATCH GRINDING WITH VERSATILE abbe JAR ROLLING MACHINES



Style M, Two-Tier machine, with two rollers per tier, mounted on built-in storage cabinet.

Multiple batches of similar or different materials can be economically ground, pulverized or mixed simultaneously on a versatile Abbe Jar Rolling Machine.

Jars, bottles or containers of different sizes can be used at one time. Each jar can be removed after its full grinding or mixing cycle has been completed—without stopping the machine.

Modern, rugged Abbe Jar Rolling Machines are available to handle single or parallel rows of jars, and in double or triple tiers for processing as many jars as required. Standard porcelain or steel jars range in size from 1 quart to 6 gallons. Built-in storage cabinets on tiered machines are optional.

Write for NEW  
Abbe Jar Rolling  
Machine Catalog 79

Address Dept. 46

**abbe** ENGINEERING CO.  
50 Church Street  
New York 7, N.Y.

Designers and Manufacturers of  
Ball, Pebble and Jar Mills • Pulverizers  
Sifters • Cutters • Mixers

Check 2143 opposite last page.  
CHEMICAL PROCESSING

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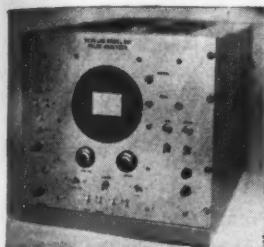
Thanks to H  
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mington, Del

NOVEM



## LABORATORY

detectors simultaneously. Instrument also contains a single channel analyzer with ten-turn potentiometer base, window controls, and fast/slow



Pulse analyzer records energy curves photographically

coincidence or anti-coincidence circuitry. Unit has four outputs for external scaler or ratemeter connection. Instrument will handle counting rates from few counts per hour up to 60,000 per second.

(Model 201 Grey Wedge-Analyzer is product of Beva Laboratory, Dept. CP, P.O. Box 478, Trenton, N.J.)

Check 2144 opposite last page.



"... and to top it off, when I get home my wife complains of laboring over a hot stove all day!"

Thanks to Harold Money, E. I. du Pont de Nemours & Co., Inc., Wilmington, Delaware.

*Only Gas Atmospheres  
Delivers completely  
unitized and factory  
tested generators . . . .*

Here's an important consideration when buying generator equipment. All Gas Atmospheres Generators are unitized, compactly constructed and assembled by experts on a common frame and thoroughly factory tested to specification. When they reach their destination they are ready to set into position and go to work with an absolute minimum of make ready.

This practice assures you that you get exactly what you ordered and permits Gas Atmospheres engineers to build more generators into a smaller frame. What's more, unitization greatly simplifies maintenance — reduces downtime and upkeep costs.

Why not look into the many advanced features found only in Gas Atmospheres generators when next you're in the market? Let us put you in touch with a user and we're sure your next generator will be a Gas Atmospheres.



The second of two 20,000 cfh food purity nitrogen generator systems, includes generator through purification — drying and compressing to 250 lbs. on a common base.

**gas Atmospheres, inc**

equipment for producing industrial gases  
20011 WEST LAKE ROAD CLEVELAND 16, OHIO

Check 2145 opposite last page.



## VISCOSITY

A product dimension as important as Ph, color or stability. Accurate viscosity control turns chance to science — waste to wealth.

## BROOKFIELD

The name you can depend on when you see it on any viscosity measurement or control instrument.

## YOU AND THE CHEM SHOW

You are a scientist, the coming Chem Show will be our meeting ground. Booth #885-87 will conveniently show in live operation the Brookfield Viscometran now in use successfully for polymerization end point determination and continuous "in process" viscosity recording. See and try, the famous Brookfield viscometers in a broad range of models, look over the many Brookfield accessories which give the Brookfield viscometer its famous flexibility. At the Chem show, anytime, make Brookfield your first source for viscosity information.

The world's standard  
for viscosity  
measurement and control



Brookfield know how  
is yours for the  
asking without obligation

# Brookfield

ENGINEERING LABORATORIES INCORPORATED  
STOUGHTON 14, MASSACHUSETTS

Check 2146 opposite last page.

## LABORATORY



### Disposable funnels

... of thin non-wetting plastic are unaffected by inorganic chemical solutions. Funnels are strong enough to be used several times and then discarded. They collect a volume of 10 to 15 ml. Five-hole cadmium-plated rack is designed for use with disposal funnels. Racks stack easily in nest fashion for storage.

(diSPo-funnels and rack are products of Scientific Products, division of American Hospital Supply Corp., 1210 Leon Pl., Evanston, Ill.)

Check 2147 opp. last page.

### pH meter electrodes

Simplified chart-form bulletin of eight pages, completely indexed and illustrated, is designed to guide users in selecting correct pH electrodes. Bul 86-5 — Beckman Instruments, Inc., Scientific Instruments Div., Dept. CP, 2500 Fullerton Rd., Fullerton, Calif. Check 2148 opposite last page.

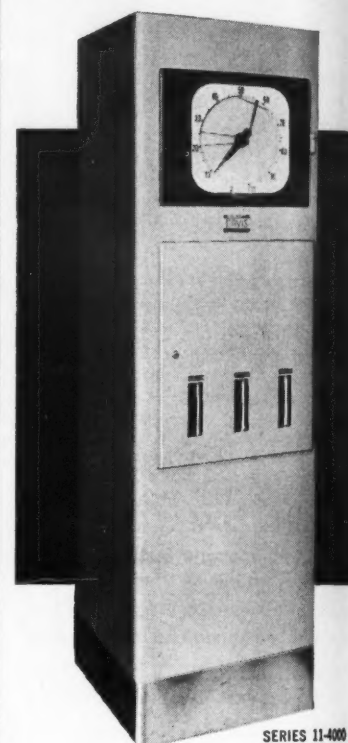
### Laboratory hydrometers

Complete specifications for manufacturer's chemical laboratory thermometers and hydrometers are listed in 24-page catalog. Laboratory instrument cat.—Nurnberg Thermometer Company, Inc., Dept. CP, 124-126 Livingston St., Brooklyn 1, N. Y.

Check 2149 opposite last page.

**NEW!**

## DAVIS PARTS-PER-MILLION OXYGEN ANALYZER



SERIES 11-4000

## For Continuous Monitoring of Oxygen Content

Continuously monitors oxygen content of process plant gas streams in parts-per-million. Full range sensitivities of 0-50 to 0-2,000 p.p.m. Applications include: trace oxygen control in polymerization of butadiene, ethylene, etc.; determination of oxygen in nitrogen, helium, argon and other inert or noble gases; detection of oxygen impurity in hydrogenation processes; and monitoring of oxygen content to prevent catalyst poisoning.

Write for Bulletin #11-40

**DAVIS INSTRUMENTS**

A Division of Davis Emergency Equipment Co., Inc.

56 Hallock St., Newark 4, N. J.

Check 2150 opposite last page.

CHEMICAL PROCESSING

Hot plate  
has manu  
hydraulic

Control  
pressure

Uses: F  
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## LABORATORY

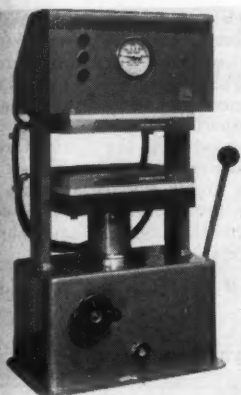
### Hot platen bench press has manually-operated hydraulic system

Controllable to 600°F, ram  
pressures to 40,000 lb

Uses: Plastic and rubber  
research or production opera-  
tions requiring controllable  
press temperatures to 600°F,  
ram pressures to 40,000 lb.

Features: Hot platen press  
has manual hydraulic system.

Description: Press has plat-  
ens with cast-in cooling coils



Hand hydraulic system of hot  
platen bench press is operated  
by lever at right

and 1500 watt calrod heaters  
in each. Temperatures are  
controlled by individual ther-  
moswitches and relays. Manu-  
al two-stage pump has high-  
speed stroke for quick platen  
closure. This converts auto-  
matically to a high pressure  
stroke. Height is 36". Weight  
is 370 lb.

(Hot platen press is product  
of Pasadena Hydraulics, Inc.,  
Dept. CP, 1433 North Lid-  
combe, El Monte, Calif.)

Check 2151 opposite last page.

### Polyethylene lab ware

Catalog of 20 pages describes,  
illustrates, and prices, manu-  
facturer's complete line of  
polyethylene laboratory ware.  
Polyethylene lab ware cat.—  
Harshaw Scientific, Div., The  
Harshaw Chemical Co., Dept.  
CP, 1945 E. 97th St., Cleve-  
land 6, Ohio.

Check 2152 opposite last page.

# is *Sterilization* a factor in your Product or Process?

*B*ecause much of the initial research on gas (ethylene oxide)  
sterilization originated at American Sterilizer, growing numbers  
of AMSCO-developed installations have been serving production  
and processing industries for more than eight years.

*H*ere, as in the traditional Pressure Steam or Dry Heat  
methods, the American Sterilizer Company offers the world's  
largest accumulation of facilities, experience and research data  
on the broad subject of sterilization.

*W*e have a complete range of techniques and automatically  
controlled equipment for standard or special installations . . .  
for laboratory, pilot plant or production application. Experimental  
and pilot plant facilities are available through our Research  
Department . . . and engineers of our Scientific Division are "on  
call" for consultation on such matters as production processes,  
techniques or packaging materials related to sterilization.

If any sterilizing process is or should be a factor  
in your product . . . outline your problem to us.  
We can help you!



GAS



PRESSURE  
STEAM



DRY HEAT



SCIENTIFIC DIVISION

AMERICAN  
STERILIZER

ERIE • PENNSYLVANIA

Check 2153 opposite last page.



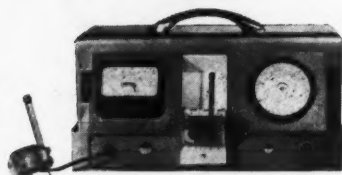
# MOISTURE TESTS IN MINUTES!!

Precise moisture tests of any product in minutes with Moore-Milford Testers . . . even with unskilled operators.

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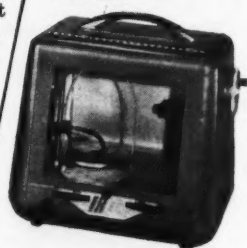


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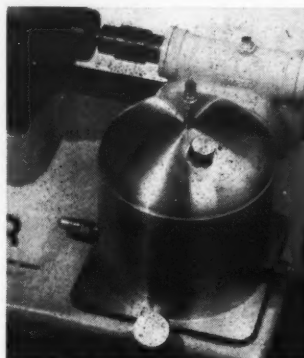
## LABORATORY

**Laboratory mixer uses gas blanket or vacuum**

Rapid take-down featured, plus mixing efficiency

**Uses:** As laboratory mixer under conditions requiring controlled temperature, pressure or vacuum, and prevention of contamination between successive batches.

**Features:** Mixer is completely demountable for cleaning.



Laboratory mixer is enclosed for mixing under inert gases

**Description:** Mixer has one-pint capacity. It consists of modified ribbon-type mixer enclosed in a sealed container for mixing under blanket of inert gas or vacuum. Mixing capacity can be doubled or tripled without purchasing additional complete assemblies. Unit has been designed for problems involving viscous or pasty materials.

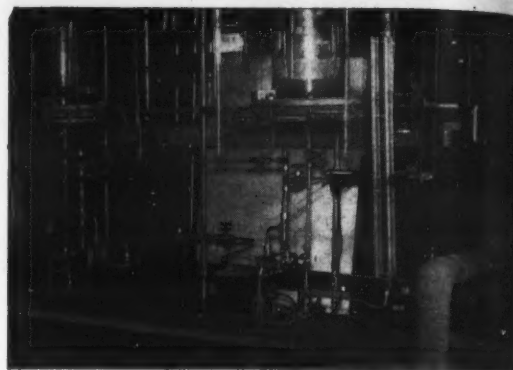
(Z-Blade mixer is product of Atlantic Research Corp. Alexandria, Virginia.)

Check 2155 opposite last page.

## Spectrograph details

Design, applications, and characteristics of prism and grating spectrographs are covered in 24-page bulletin. Publication represents third in a series of spectrochemical analysis guidebooks being prepared by manufacturer. Bul CH403—Jarrell-Ash Co., 26 Farwell St., Newtonville 60, Mass.

Check 2156 opposite last page.



**CORSON-CERVENY MICRO BELLOWS PUMPS deliver feed materials to Koppers Research Bench Scale Pilot Plants**

When developing bench scale continuous processes requiring accurately proportioned feeds, Koppers' Verona Research Center scientists turn to the Corson-Cerveny Micro Bellows Pump. Due to simplicity of construction with consequent ease of maintenance and cleaning, this pump has been first choice on many important operations.

This is another of the many ways the Corson-Cerveny Micro Bellows Pump helps research and development laboratories, especially where highly corrosive liquids are being pumped. These pumps, because they are fabricated of stainless steel and designed to eliminate packing, are free of corrosion. Write for descriptive bulletin.

**RESEARCH APPLIANCE CO.**

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Problems of exchange and reduction of heat in the process industries are best solved when limitations of specific materials, shapes and fabrication methods are eliminated. Only National-U.S. Radiator Corporation is free to consider both conventional fabrication from carbon and alloy steels and non-ferrous metals and also the advantages of corrosion-resistant cast iron cooling sections. Sometimes the most effective solution is a combination of both.



### Heat Exchangers

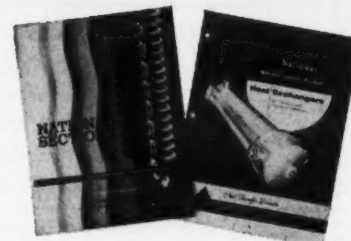
Heat exchangers are the most widely used of all process equipment. They are designed to transfer heat between two fluids. They are available in a wide range of sizes and materials. They are designed to operate at high pressures and temperatures. They are designed to be easy to maintain and repair.

### Cooling Sections

Cooling sections are used to cool process fluids. They are designed to transfer heat from the process fluid to a cooling medium. They are available in a wide range of sizes and materials. They are designed to operate at high pressures and temperatures. They are designed to be easy to maintain and repair.

## Write for Literature!

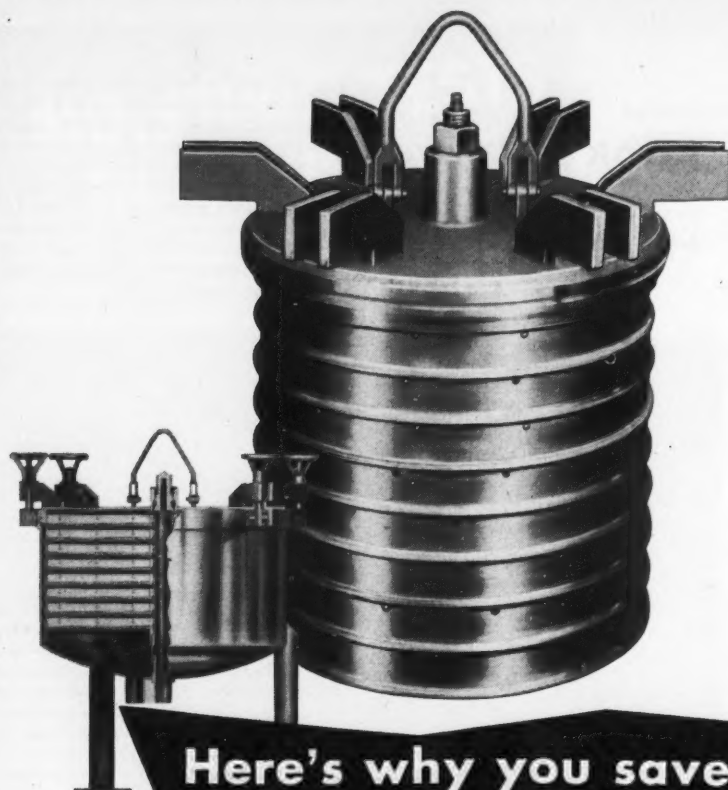
If you have an immediate problem on heat transfer, wire or phone collect and we'll give you immediate service. We have specification forms, data sheets, product bulletins and catalogs for your convenience.



Heat Transfer Division  
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## Here's why you save FILTER DOWNTIME

There's a reason why you recover solids so quickly from a Niagara horizontal plate filter! The cover and plate bundle come out together. A single compression nut is then removed and the cover lifted off. Then plates slide off the central manifold. No tie rods to handle. What a savings in downtime . . . what quick, easy recovery of cake!

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SPECIALISTS IN LIQUID-SOLIDS SEPARATION

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## briefs

Abstracts of pertinent articles in other industrial publications... selected by CP editors as a service to you

### Propane fractionation

Separation of hydrocarbons according to solubility in liquid propane and by distillation are compared. Advantages of solvent fractionation are presented. Four pages, one table, two figures. ("Petroleum Refiner," July 1957, page 141.)

### Germanium rectifiers

Germanium rectifiers lead in converting AC to DC power in this country. Germanium cells have high frequencies, long life, high reverse resistances, and good regulation. Four pages, four figures, three photographs. ("Power," July 1957, page 73.)

### Curing of rubber

This study of nonfree sulfur curing systems for age-resistant styrene-butadiene rubber shows vulcanizates with greater age resistance than those produced where free sulfur accelerators are employed. Twelve pages, five tables, nine figures, 13 references. ("Rubber World," August 1957, page 675.)

### Electric smelting

Beneficiated ilmenite ore was smelted in a continuous 3-phase, 250-kva, open-top electric furnace to produce high-titanium slag and pig iron. Paper-mill bark was used to produce furnace charge of low bulk density as required in coal dry-top smelting. Six pages, seven tables, one figure, eight references. ("Canadian Mining and Metallurgical Bulletin," July 1957, page 405.)

### Goodloe packing

Compared to other packings for vapor-liquid contacting operations, Goodloe packing which is knitted of Monel wires, has high theoretical plate efficiency, high throughput capacity, average holdup, and low pressure drop. Five pages, one table, three figures, nine references. ("Industrial and Engineering Chemistry," July 1957, page 1062.)

### Spectrochemical analysis

Spectrochemical methods and direct-reading instrumentation are applied to analysis of alumina, bauxite, and other non-metallics. Technique is faster, less costly, and allows more complete control than do wet methods. Four pages, seven tables, one figure, three references. ("Analytical Chemistry," August 1957, page 1141.)

### Groundwood pulp

Translation of a German paper on the effect of pulpwood quality in the production of groundwood covers species, storage, moisture, resins, age, shape of stick, ratio of spring and summer woods. Six pages, one table, four figures, 12 references. ("Paper Trade Journal," August 1957, page 50.)

### Corrosion by water

Water works practices are discussed under the headings of contributing factors, corrosion control, noncorrosive material, and protective coatings. Three pages, one figure. ("Water and Sewage Work," July 1957, page 308.)

### Corrosion

Corrosion chief metals (iron, copper) glycol-water goes into cupramine causes corrosion. Five pages, 16 figures, 16 references. ("A

### Anodic coating

Densities anodic coating are reported tables, onences. ("M" August 1957,

### Evaporation

From Engineering approach evaporator general materials and Seven pages figure. ("M" August 1957,

### Irradiation

Important electrical characteristics when polymerized are relatively. (Plastics, five

### Sludge treatment

This paper discusses the activation of plants. They are discussed in a photograph. ("Waste Management," 1957, page

### Fertilizer

Production of Florida discussed from Fertilizer does not



### Corrosion by glycol

Corrosion potentials of the chief metals in coolant systems (iron, aluminum, and copper) were measured in glycol-water solutions. Copper goes into solution as blue cupramine complex which causes corrosion of aluminum. Five pages, six tables, eight figures, 16 references. ("Corrosion," August 1957, p. 531t.)

### Anodic coatings

Densities and porosities of anodic coatings on aluminum are reported. Four pages, four tables, one figure, 15 references. ("Metal Finishing," August 1957, page 55.)

### Evaporator data

From England comes a new approach to multiple-effect evaporator problems and a general method for estimating areas and steam requirements. Seven pages, three tables, one figure. ("The Industrial Chemist," July 1957, page 331.)

### Irradiated polyethylene

Important physical and electrical changes that take place when polyethylene is irradiated are evaluated quantitatively. Six pages, eight tables, five figures, 19 references. ("Plastics," July 1957, p. 129.)

### Sludge treatment

This paper covers the operation of final settling tanks in activated sludge treatment plants. Troubles and remedies are discussed. Four pages, five photographs, seven references. ("Wastes Engineering," July 1957, page 350.)

### Fertilizer

Production of fertilizer from Florida leached-zone ore is discussed. Recovery of uranium from ore is described. Fertilizer is well-granulated, does not cake in storage,

and possesses good agronomic value. Five pages, three tables, three figures, nine references. ("Agricultural and Food Chemistry," August 1957, page 587.)

### Water softening

A consulting engineer discusses methods of water softening, economics, and current views of syndets as they bear on the situation. Eight pages, three tables, one figure, eight references. ("Water and Sewage Works," August 1957, page 327.)

### Tolerances

Logical rules for writing and interpreting tolerance specifications are presented from the standpoint of quality control. Two pages, three references. ("Industrial Quality Control," August 1957, page 16.)

### Liquid hydrogen

Liquid hydrogen can be produced economically and simply by means of a dual-pressure process. Three pages, one table, five figures, two references. ("Refrigerating Engineering," August 1957, page 39.)

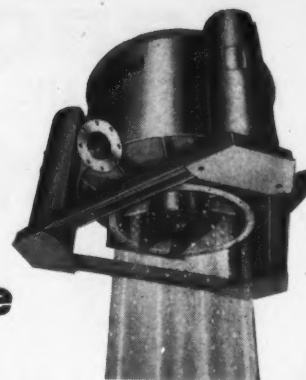
### Gas chromatography

This paper suggests columns and partition liquids for use with gas chromatographic methods applied to oil refining. Five pages, nine tables, nine figures, three references. ("Petroleum Refiner," August 1957, page 157.)

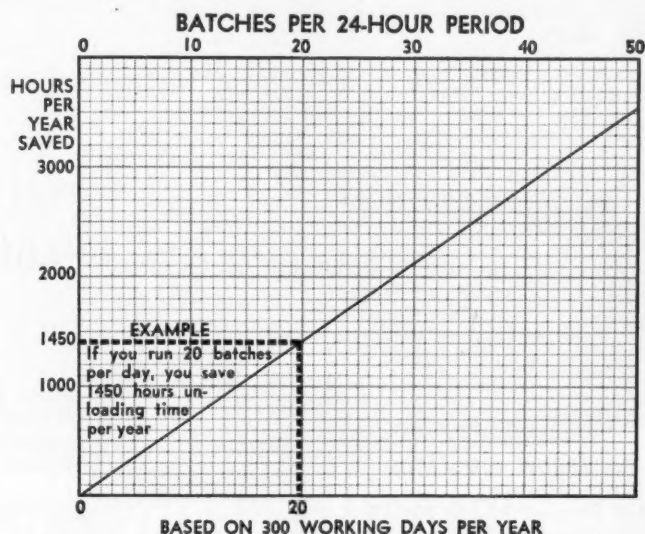
### Corrosion of aluminum

Intergranular corrosion of aluminum by superheated steam is reported. Presence of iron in aluminum alloys decreases corrosion. Four pages, six tables, four figures, eight references. ("Industrial and Engineering Chemistry," August 1957, page 1251.)

## PREDICT the centrifuging hours you save in a year



This most revealing chart quickly shows how much unloading time you can actually save, with Batch-Master's rapid bottom discharge and hydraulic unloader. The chart is based on Batch-Master's unloading time (30 seconds average) . . . as compared with that of a manually unloaded batch centrifugal (15 minutes or more). If the chart gives you a jolt, investigate Batch-Master.



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# ARROW AUTOPNEUMATIC CONTROL



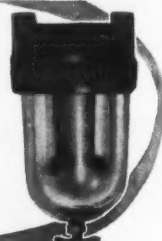
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to thoroughly condition and control compressed air for pneumatic power tools and appliances.

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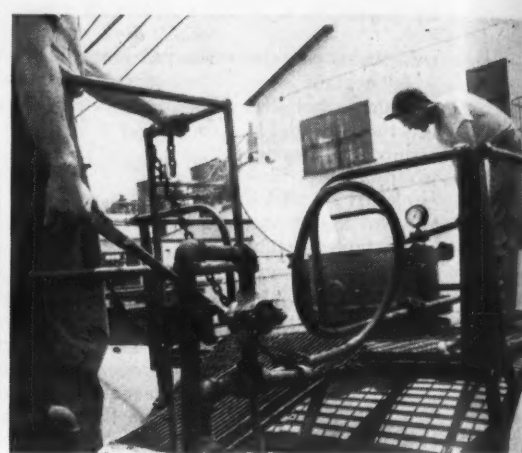


Fig. 1—Valves used on chlorine-unloading lines withstand liquid chlorine under pressure and operate winter and summer in a tough environment

In making DDT, Michigan Chemical saves thousands of dollars when . . .

## valves hold chlorine under pressure —cut downtime and maintenance costs

FRANK McELROY, Associate Editor  
With MARK FRIMODIG, DDT Plant Supt.  
Michigan Chemical Corp.  
St. Louis, Michigan

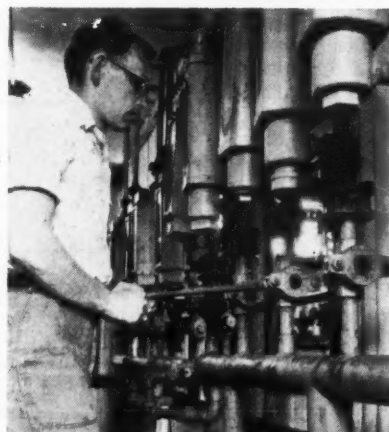


Fig. 2—Over two dozen 1 and 2" plug-valves are used on manifold regulating flow of chlorine vapor to chlorinators in DDT process

**Problem:** Valves used on the chlorine lines at Michigan Chemical's DDT plant in Saint Louis, Michigan, took quite a beating from both the chlorine and the corrosive outdoor environment.

Liquid chlorine is unloaded from tank cars into storage (Fig. 1), and later the vaporized material is fed through a manifold (Fig. 2) to chlorinators which make chloral from ethyl alcohol. This in turn is made into DDT.

Previous steel plug-cocks rusted very badly and froze shut. Many of them leaked excessively — enough so that operators had to wear gas masks for protection.

**Solution:** In the fall of 1951, the company began to make the change-over to plug-valves made of a corrosion-resistant alloy. Bodies and plugs of these valves are separated by a Teflon sleeve. The tapered plug has an adjustable screw which gives a positive sealing pressure.

At present, there are 32 valves in use. One-inch valves are used as open-shut valves on the unloading lines from the tank cars and on the manifold. Two-inch valves (below in Fig 2) are used for throttling. A two-inch valve is also used

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on a drain line which handles oleum at 400°F, at another part of the process.

When any of the two-inch valves on the manifold reaches a point where it can no longer hold chlorine under pressure, it is repaired and saved so that it can be used on the drain line of the chloral-making section.

**Results:** The major advantage realized from use of these valves is their freedom from excessive maintenance. When, infrequently, they do need repair or replacement of the Teflon sleeve, all parts of the valve can be easily replaced.

This has saved Michigan Chemical many thousands of dollars over the past six years, by reducing operating downtime and maintenance labor costs.

(Durco Type F valves are products of The Duriron Co., Inc., Dayton 1, Ohio.)

Check 2164 opposite last page.

### Strong aluminum alloy highly corrosion resistant in 150 to 300°F range

**Uses:** For aluminum vessels, storage tanks, tubes, and pipe in handling chemicals at elevated temperatures.

**Features:** Alloy displays high resistance to corrosion and stress corrosion in all temper specifications.

**Description:** Aluminum alloy provides maximum strength for aluminum applications exposed continuously or intermittently to temperatures in 150 to 300°F range. There are no restrictions on extent of cold forming. Best welding results for all thicknesses are gained with welds applied by inert gas shielded consumable arc method. Inert gas tungsten arc method can be used on thicknesses up to 1/2". Tensile strength of arc welded joints is equal to tensile strength of alloy in annealed temper.

(Alloy X5454 is product of Aluminum Co. of America, 1501 Alcoa Bldg., Pittsburgh 19, Pennsylvania.)

Check 2165 opposite last page.

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## WAUKESHA P. D.\* Corrosion Resistant Pumps designed for perfect product sealing ... Longer service life

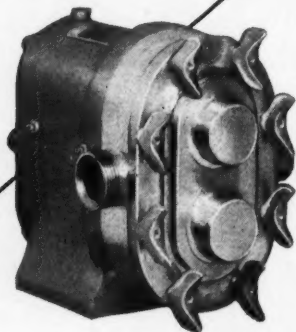
New Twin O-Rings in the WAUKESHA Corrosion-Resistant Pump provide a positive product seal without using troublesome packing glands. These are available in Buna-N (neoprene) for normal conditions, or in Kel-F where excessive corrosion or high temperatures are met.

Newly developed also is a re-usable gasket in the pump head which eliminates the uncertainty and expense of paper gaskets.

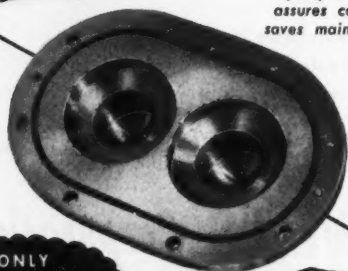
Greatly improved service life and remarkably low maintenance keynote the new WAUKESHA Pump. And the principle of positive displacement provides a smooth, virtually non-pulsating flow without aeration, cavitation or product damage — against pressures up to 150 PSI and vacuums up to 29 inches of mercury.

No matter what may be your pumping or corrosion problems WAUKESHA provides a pump to meet the most difficult conditions.

New twin blade "counterbalanced" impellers provide better distribution of load factor at all speeds and pressures.



Reusable rubber pump head gasket assures complete seal, saves maintenance costs.



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gives you a quarter century's  
experience and reliability

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Check 2167 opposite last page.

## ENGINEERING

Stop leakage, maintenance; eliminate downtime with forged-steel valve

Seat and disk good as new after three years

**Problem:** Leakage of seat and packing on stop valves at Pittsburgh Works By-products Plant, Jones & Laughlin Steel Corp., made it necessary to assign considerable time of pipe fitter and helper to repair work on coke oven valves.

An individual valve steam line feeds each oven and requires  $\frac{3}{4}$ " stop valve. Each time an oven is charged with coal, valve is opened to admit steam so that smoke and dirt are dampened during charging.

Steam pressure varies from 100 to 150 psi, saturated, depending on type of coke oven battery. Valves used in this service were only lasting a short period of time.



Forged-steel stop valves are "good as new" after three years service on coke oven steam lines

**Solution:** A 600-lb forged-steel stop valve was installed on all coke oven steam lines. Lower pressure drop through valve enables use of smaller pipe sizes. Stainless steel seats and disks are borized in mated pairs. Packing adjustment is simple, and oversize hand-wheel makes operation easy. Valve has built-in globe and angle designs from  $\frac{1}{4}$  to 2" sizes, with screwed or socket welding ends.

**Results:** Inspected after three years service, 600-lb forged-steel stop valve was found to be good as new. Seats

## Petrometer SERIES 1400 LIQUID DEPTH GAUGES

### ACCURATE and EASY TO INSTALL

Available in 4 Models, Petrometer Series 1400 Tank Gauges operate on the sound principle of hydrostatic pressure. No moving parts, no expensive electrical or electronic equipment. Large vertical scale gives accurate, easy-to-see reading. And construction features make installation easy.

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## MORSE DeLUXE 500 Portable ROTATOR

- MIXES
- BLENDS
- TUMBLES
- CLEANSSES



### Faster and at less cost!

The patented Morse De Luxe 500 Rotator will handle 1 to 55 gal. containers, weighing to 500 lb. They revolve safely, smoothly, efficiently at 10, 20, 40 rpm on this powerful, compact, portable, motorized unit. Cuts cost of mixing, blending, tumbling, cleansing. Easily moved and loaded by one man. Has  $\frac{3}{4}$ " dia. power driveshaft with self-aligning ball bearings. Four adjustable 4" dia. Neoprene-tread drive wheels. Fully enclosed worm-gear drive with 30-1, 15-1, 7 1/2-1 reductions. Weighs 137 lb. Delivered complete with motor, drive mechanism and tipping lever. Write for Free bulletin and catalog, showing full Morse line of Drum and Barrel handling equipment.

**MORSE MANUFACTURING CO. INC.**  
757 West Manlius St. East Syracuse, N. Y.

Check 2169 opposite last page.

CHEMICAL PROCESSING

and packings did not show signs of wear. Costly maintenance and downtime caused by leakage were eliminated. Jones & Laughlin standardized on valves of this type for all steam-line service.

(Fig 2698 stop valve is product of Edward Valves, Inc., subs. of Rockwell Mfg. Co., East Chicago, Ind.)

Check 2170 opposite last page.

**Automatic speed change of several motors equally and simultaneously**

Combines Varidyne, Varitrol

**Uses:** For controlling motor speeds in applications such as material handling, conveying.

**Features:** Variable speeds, multiple drive system can be automatically controlled in response to variety of input signals.

**Description:** System combines Varidyne, a system consisting of Varidyne Power Unit and one or more AC induction motors, and Varitrol, an automatic pneumatic control system. Varidyne system has converted standard 60-cycle, 3-phase squirrel-cage motor, by means of an alternator, into a variable-speed motor. This provides variable frequency power to Varidyne Motors, thus linking them together electrically. Speed changes at power unit cause each motor in system to vary equally or proportionately.

Selection of enclosures and speed range of Varidyne Motors is practically unlimited. Drift-proof, totally-enclosed and explosion-proof designs are available in speeds from 1 to 10,000 rpm, and in ratios up to 5:1 and higher. Varidyne Motors can be provided with integral gearing or with integral variable speed transmission for speed trimming and are available from 1/3 to 25 hp at maximum rpm.

(Automatic AC variable speed system was developed by U. S. Electrical Motors Inc., Box 2058, Terminal Annex, Los Angeles 54, Calif.)

Check 2171 opposite last page.



## BALDWIN-HILL COMPANY

Complete line of Industrial Insulations

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# If you could lift the covers ... you'd find **BALDWIN-HILL MONO-BLOCK®** and **SUPER POWERHOUSE® CEMENT**

insulating every vessel heated to 600° F. and over ... covering all insulated surfaces more than 24" in diameter at

## Tidewater Oil Company's New Delaware Refinery

A trainload of 50 cars—over 1,000,000 bd. ft.—of B-H Mono-Block helps prevent costly heat losses and permits better control of operating temperatures. By standardizing on Mono-Block, C. F. Braun Co., Engineers and Constructors, sayed stocking separate blocks for both low and high temperatures since Mono-Block is efficient over all temperatures from 75° to 1700° F. B-H Super Powerhouse Cement was used to point all joints and, where required, was applied in a single coat as an insulating - finishing cement.



For a detailed report on the insulation of this economical installation, just staple the keyed corner of this ad to your letterhead and mail.

J375

Check 2172 opposite last page.



**Pump meters liquid CO<sub>2</sub> accurately, dependably**

Maintenance is negligible on controlled-volume unit

**Problem:** Weighing trailers before and after deliveries was not a practical method of measuring delivered quantities of liquid CO<sub>2</sub>. Flow meter and counting device combination needed continual adjustment, making accuracy doubtful. Poor lubricating qualities of liquid CO<sub>2</sub> caused frequent pump failure, requiring costly replacement and repairs.

BEV-CO/2 division of Pipe Welding Supply Co., Elmira, N.Y., manufactures and distributes liquid carbon dioxide in insulated tanks mounted on truck trailers. Liquid is main-



Operator starts gasoline motor which drives controlled-volume pump. Pump provides accurate, dependable metering of liquid carbon dioxide

tained at approximately 300 psi and 0°F. Some customer's tanks were set up for high-pressure storage and some for low pressure. Same delivery pump was used for both.

Ideal equipment would meter and pump liquid accurately against all pressures, and yet be rugged enough to withstand hard usage and rough road conditions.

**Solution:** About three years ago BEV-CO/2 installed duplex, controlled-volume pumps driven by four-cylinder, gasoline motors through 41:3 ratio gear reducers, on delivery trucks. CO<sub>2</sub> at -5 to 5°F is pumped at 500 gph, 300

*In Iron Body Wedge Gate Valves,  
Outside Screw and Yoke Design,*

**Walworth offers you these  
8 outstanding advantages!**

**STRONGER CONNECTIONS.** T-head disc-to-stem connection on OS&Y types permits wedge to properly seat itself.

**TIGHTER SEAL.** Solid web type disc on OS&Y valves provides tight closure, greater strength and longer service.

**REDUCED TURBULENCE.** Fluid action is minimized due to this straight-flow port design.

**FEWER OBSTRUCTIONS.** Seat rings of bottom seated types are screwed into body to prevent gum and grit accumulations.




\*WALWORTH is a registered trademark of WALWORTH COMPANY

Walworth Subsidiaries: ALLOY STEEL PRODUCTS CO. • CONOFLOW CORPORATION • GROVE VALVE AND REGULATOR CO.



ce  
s!



**SURE-GRIP HANDWHEEL.** Fluted design assures a sure grip, even with greasy gloves.

**HIGH CORROSION RESISTANCE.** Brass liner protects glands from deterioration and scoring.

**EASIER REPACKING.** Hinged gland eye-bolts on OS&Y valves permit fast maintenance under full pressure.

**LESS DAMAGE.** Bronze back-seat bushing in bonnet of OS&Y valves prevents scoring, guides stem accurately.

Walworth Iron Body Gate Valves are available with screwed or flanged ends, in sizes and types for every purpose.

For full information see your Walworth Distributor or write: Walworth Company, 60 East 42nd Street, New York 17, N. Y.

# WALWORTH\*

DISTRIBUTORS IN PRINCIPAL CITIES THROUGHOUT THE WORLD

M & H VALVE & FITTINGS CO. • SOUTHWEST FABRICATING AND WELDING CO., INC. • WALWORTH COMPANY OF CANADA, LTD.

Check 2173 opposite last page.

psi suction, and 600 psi discharge pressure. Pumps use ceramic ball valves, 316 Stainless ball seats, and 2½-inch diameter plungers. Maximum stroke length is 4". Stroke length is manually changed by screw adjustment during periodic calibration runs.

A reset ratchet counter is used to measure pumping capacity by totalizing number of plunger strokes. Stroke counter reading is directly convertible to pounds.

**Results:** Pumps have been used in the field for three years, giving accurate, dependable service. Because of versatile qualities of this unit, deliveries can be made to many small and medium users who in the past were unable to obtain liquid CO<sub>2</sub> pumped into their own tanks. Maintenance and repairs have been negligible.

(Controlled-volume pump was supplied by Milton Roy Co., 1300 E. Mermaid Lane, Philadelphia 18, Pa.)

Check 2174 opposite last page.

## Lightweight check valve operates at pressures up to 125 psig

**Uses:** For air service and other applications.

**Features:** Lightweight unit (only four ounces) withstands operating pressures up to 125 psig and temperatures up to 175°F.

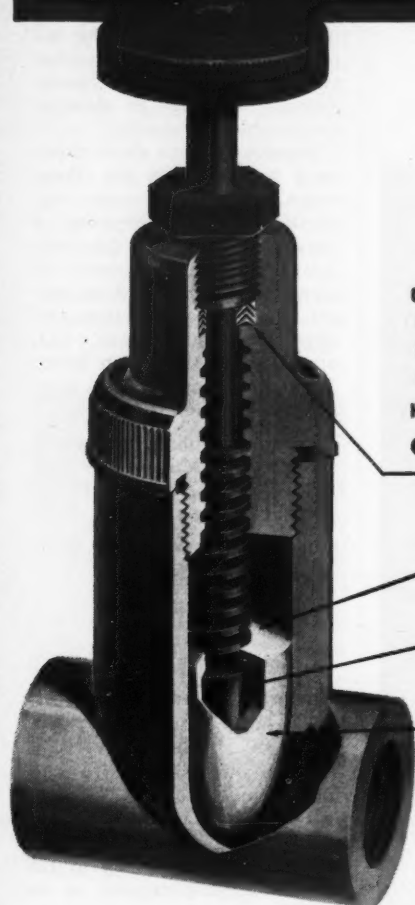
**Description:** Check valve is available in sizes of ¼ and ¾". It is constructed of aluminum bar stock, with stainless steel spring and resilient seal. Aluminum body is anodized to withstand 200-hour salt spray test specification. Poppet is only moving part, and it will seal at zero pressure. It has cracking pressure of .75 psig. The ¾" check valve, with 90 psi free air applied, has pressure drop of 3 psi at 30 cu ft per minute free air.

(Check valve is product of Ross Operating Valve Co., Dept. CP, 120 E. Golden Gate Ave., Detroit 3, Mich.)

Check 2175 opposite last page.

# NEW!

## ALL-PLASTIC GATE VALVE



### VANTON FLEX-PLUG\* VALVE

1/2" - 2" sizes

#### COMBINES

- No-pressure-drop construction of gate valve
- Throttling flow-control feature of globe valve
- PVC or styrene-copolymer construction

#### HANDLES WIDE RANGE OF CORROSIVES AND SLURRIES

#### Check these features:

- Teflon\* chevron packing provides leak-free sealing. (\*Reg. trade mark for duPont's tetrafluoroethylene resin)
- Back-seating feature of cap: with valve completely open, cap seats against bottom face of bonnet, relieving pressure on packing.
- Free-to-swivel plug: cap seats on different surface at each closure, provides even wear, perfect closure.
- Flexible synthetic cap: easy replaceability without removal of valve from line minimizes maintenance, offers application flexibility. Resilience enables it to handle abrasive slurries without wear.
- Completely unrestricted flow of gate valve when fully open.
- Throttling control of globe valve for partly open positions.

- All-plastic design—PVC or styrene-copolymer (U.S. Rubber Co. Uacolite CP). Replaceable caps available in Neoprene, Buna-N, and Hypalon (Kel-F elastomer on special order).

- Suitable for vacuum service—resilient cap makes excellent seal.

- Rated for 150-lb. service—PVC line handles temperatures up to 140°F., styrene-copolymer up to 170°F.

- Adaptable to all existing plastic pipe and fittings; especially suited to Vanton P, S, and N lines of plastic pipe and fittings.

Catalog FP-1 gives full details. Write for your free copy today!

\*Pat. Pending



**VANTON PUMP**  
and Equipment Corp. • Hillside, N. J.

DIVISION OF COOPER ALLOY CORP.

Check 2176 opposite last page.

## ENGINEERING

### Wire cloth catalog

Types and sizes of manufacturer's industrial wire cloth are listed in 94-page catalog. Typical applications and many useful metallurgical tables are included. Wire Cloth Cat.—The Cambridge Wire Cloth Co., Cambridge, Md.

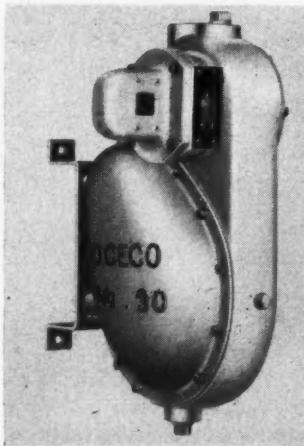
Check 2177 opposite last page.

### Highly accurate tank gage compensates for weight of tape mass

Uses: For recording changes in liquid level of tank.

Features: Reported to be highly accurate, gage compensates for weight of tape mass. It is readily adaptable to remote reading.

Description: Friction or drag which tends to impair accuracy of tank gage is reduced to minimum. All shafts, including those in gage housing and sheaves, are stainless steel supported on rulon bear-



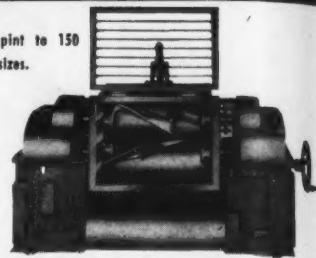
Completely automatic tank gage is readily adaptable to remote reading

ings. Shafts are free-turning and gage-sensitive to any change in liquid level under all temperature and service conditions.

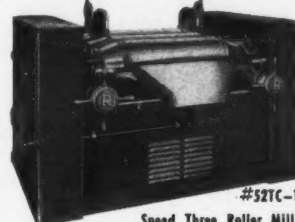
No grease or lubricant is needed. There is no gumming or corrosion. Indicator, which is sealed off from main gage housing, is open to atmosphere thus avoiding fogging of the

## Leading mfrs. of ROSS MIXING AND GRINDING EQUIPMENT for over 90 years

• 1 pint to 150 gal. sizes.



#41L-10 Gal. Double Arm Kneader with two speed brake motor. Jacketed trough and motor operated lift optional.

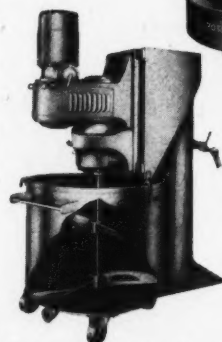


• 4 1/2 x 10, 14, 9 x 24, 12 x 30, 14 x 32, 16 x 40" sizes.

#52TC-14" x 32" High Speed Three Roller Mill. Hydraulic adjustment and pressure recording gauges optional.

#30C-50 Gal. Heavy Duty Change Can Mixer. Adjustable outer scraper, cover with charging port, and gates on cans optional.

• 8, 16, 20, 50 and 60 gal. sizes.




#130H-250 Gal. Change Tank Mixer with hydraulic raising and lowering and variable speed motor. Various type stirrers and high speed impellers optional.

• 80, 150 and 250 gal. sizes.

#130EL-1 Gal. Double Planetary type Change Can Mixer with shearing action stirrers, and variable speed reversing type motor. Jacketed cans and portable trucks for cans optional.

• 1, 2, 3, 4, 6, 15, 25, 50, 65, 85, 110 and 150 gal. sizes.

Write for complete information on these or other types of  equipment.

**CHARLES ROSS & SON  
COMPANY, INC.**

154 Classon Avenue  
Brooklyn 5, New York

Check 2178 opposite last page.

CHEMICAL PROCESSING

glass. Gage housing and all piping is supported on side rather than roof of tank.

Gage is easily installed on cone, expansion, or floating roof tanks, or tanks already in service. Can be "zeroed" easily during installation or at any time when gage is in service. Aluminum housing resists corrosion and does not require paint.

(Tank gage No. 30 is product of Oeco Div., The Johnston and Jennings Co., 6917 Bessemer Ave., Cleveland 27, Ohio.)

Check 2179 opposite last page.

#### Steam trap 'treasure trove'

Three pages of condensed tables giving complete, concise presentation of steam trap pressures, capacities, and orifice sizes, form a treasure of information in 68-page catalog. "How to" pages on selection, sizing, and installation of steam traps are an additional feature. Cat 69—Strong Steam Specialties Division, Strong, Carlisle, & Hammond, Dept. CP, 1392 West 3rd Street, Cleveland 13, Ohio.

Check 2180 opposite last page.

#### Cable clamps of Teflon are tough and flexible, make good insulators

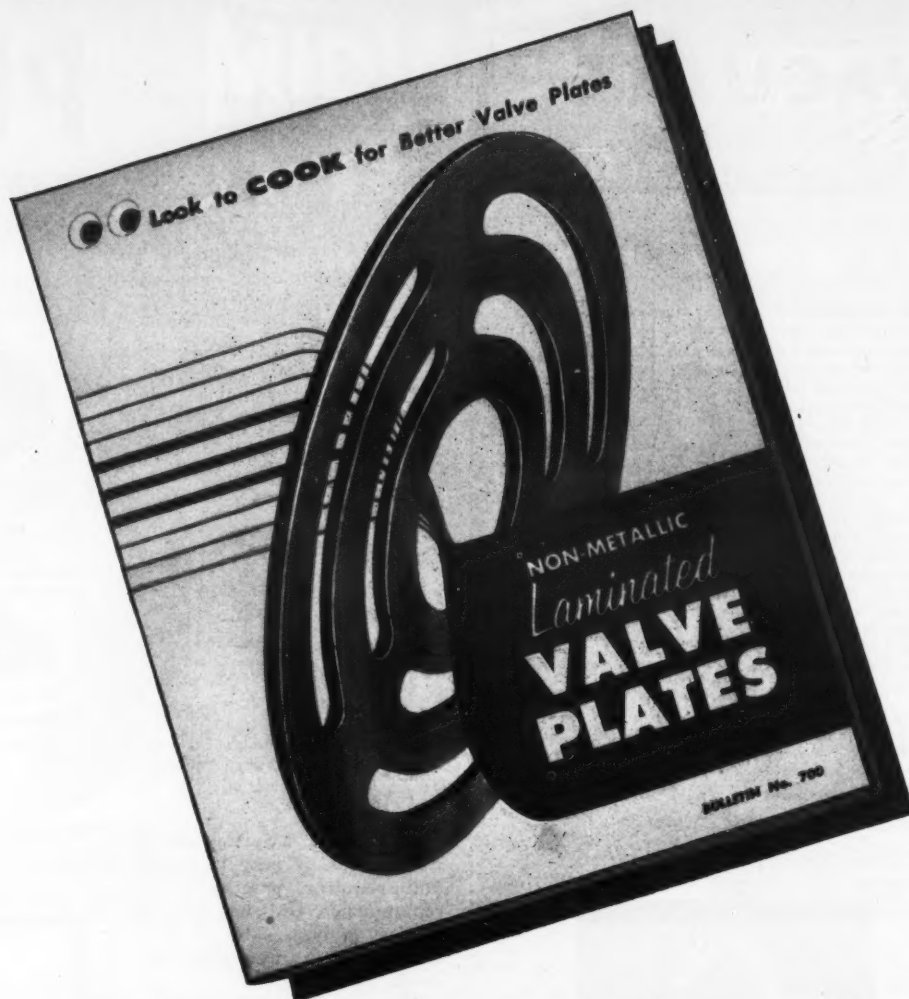
**Uses:** For severe service electrical installation.

**Features:** Clamp is chemically inert, non-adhesive and heat resistant over a wide temperature range.

**Description:** Cable clamp fabricated from Teflon is immune to effects of weathering and seasonal change even in installations where direct and constant exposure occurs. Tough, flexible clamp is reported to have superior insulating qualities and offers little friction. Water absorption is rated at zero.

(Teflon Cable Clamp is product of Weckesser Co., 5701 Northwest Hwy., Chicago 30, Illinois.)

Check 2181 opposite last page.

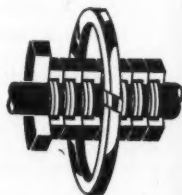


## Send for this informative new bulletin today!

Cook Bulletin No. 700, "Non-Metallic Laminated Valve Plates" is now off the press. It contains up-to-date facts on the when, why and where of non-metallic valve plates—plus help-

ful data on applications, delivery and special materials. It also explains how Cook laminated valve plates are different from competitive brands, and *why* they are better.

USE THE COUPON FOR YOUR FREE COPY, TODAY!



**C. LEE  
COOK  
COMPANY**

Division of Dover Corporation

*Rings and Packings Since 1888*

C. Lee Cook Company  
932 South Eighth Street  
Louisville 3, Kentucky

Gentlemen: Without obligation please send a copy of Bulletin No. 700.

Company \_\_\_\_\_  
Street \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_  
Att. Mr. \_\_\_\_\_ Title \_\_\_\_\_

Check 2182 opposite last page.

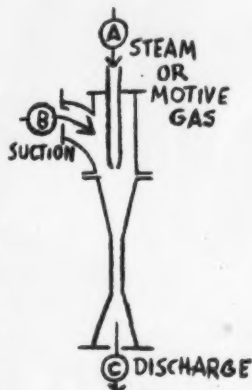


# how to EVACUATE air or gases with **NO MOVING PARTS**

I-R Ejectors make it  
as easy as A, B, C

A SOURCE of pressurized steam or air is the only motive power you need for a dependable, low cost vacuum system. A simple, I-R Ejector, with no moving parts, will do all the rest—easily meeting a wide range of applications for the evacuation of air, inert or corrosive gases.

Your nearest Ingersoll-Rand branch office or representative will gladly analyze your vacuum problems and recommend the most suitable equipment for the job. Full information on Steam Jet Ejectors is contained in Bulletin 9013-A—yours for the asking.



WHAT COULD  
BE SIMPLER?



**Ingersoll-Rand**  
11 Broadway, New York 4, N. Y.

Check 2183 opposite last page.



## Specialized Die-Cutting and Gaskets

- More than 35 years experience in die-cutting non-metallic materials.
- We are equipped to slit rubber slabs up to 12" thick — or, to die-cut materials as thin as .001" onion skin thin paper.
- Difficult adhesive coated, or impregnated, materials are easily handled through our unique cutting process.
- Materials handled and stocked include paper, asbestos, fibre, rubber, cork, felt, synthetics and many miscellaneous materials.
- All steel rule dies are made in our own plant.

Ask about our technical and consulting service.

**Rhopac, Inc.**

3439 Cleveland Street, Skokie, Illinois

Manufacturers of mechanical packings, industrial and boiler gaskets, radio speaker gaskets, steel rule dies, flexible packing hooks.

Check 2184 opposite last page.

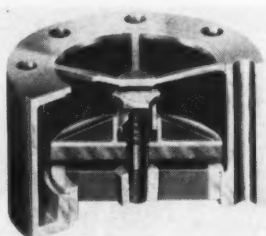
## ENGINEERING

**Spring-loaded check valve  
eliminates problems  
in fluid systems**

Stops line surges

Uses: For controlling flow in fluid-system line.

Features: Spring-actuated internal disc closes immediately as flow ceases. Line surges and back-pressure are stopped. Air cushions and similar anti-hammer devices are eliminated.



Spring-actuated internal disc does not depend upon reverse flow for shut-off

**Description:** Spring-loaded check valve is easy to install and requires practically no maintenance. Unit has bearing guides on both sides of disc, and full-flow area that exceeds pipe area.

Metal-to-metal or plastic-to-metal seating assures leak-proof seal for any type of service. Valve operates in any position.

Standard sizes of check valve are from 2 to 18", and pressures range up to 2500 psi. Body and trim are supplied in variety of metals to meet specific requirements.

(Check valve is product of Combination Pump Valve Co., 850 Preston St., Philadelphia 4, Pennsylvania.)

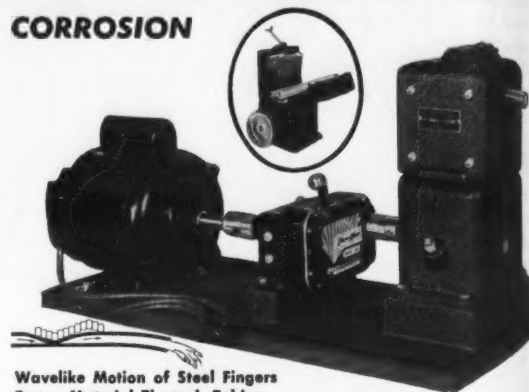
Check 2185 opposite last page.

### Stores volatiles, corrosives

Various types of roof tanks used for storing all types of volatile or corrosive products are described and illustrated in 24-page catalog. Cat 57FR — Hammond Iron Works, 744 Broad St., Newark 2, N. J.

Check 2186 opposite last page.

# PUMP LIQUIDS GASES SLURRIES WITHOUT CONTAMINATION OR CORROSION



Wavelike Motion of Steel Fingers  
Forces Material Through Tubing

Cap. 0.2 cc. per min. to 4.5 G.P.M.

Prices \$60.00 to \$550.00

depending on size and accessories

Write for  
Descriptive  
Literature

**SIGMAMOTOR, INC.**  
18 North Main St. • Middleport, N.Y.

Check 2187 opposite last page.

## What's A "New Solution"?

It's an article in **CHEMICAL PROCESSING** describing a new way of solving a tough plant operating problem. In each issue you will find specific "case histories" showing how these processing problems were solved.

Each article states the operating problem . . . explains the process used and gives details of how problem was solved . . . shows results secured.

Take a look at "New Solutions" articles in this issue — they might suggest a "solution" for some of your tough processing problems.

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For more information on product at right, specify 2189 see information request blank opposite last page.



LARGER  
SIZE  
RANGE

# MIDWEST ELBOWS

IMPROVED  
DELIVERY

HEAVY WALL CARBON STEEL AND ALLOY



12' Long Radius  
2 1/4" Wall Thickness  
1 1/4% Chrome

## STRAIGHT LONG RADIUS 90° ELLS

Nominal Pipe Size	Maximum Wall Thickness
36	1.250
30	2.000
26	2.000
24	1.500
20	1.375
18	2.250
16	2.125
14	1.750
12	2.000
10	2.000
8	1.750
6	1.000
5	.625
4	.750
3	.625
2 1/2	.375
2	.500

These straight elbows can be furnished with LONG TANGENTS at no extra cost. All thicknesses less than those shown above are, of course, available.



20' x 10' Reducing  
2" Wall Thickness  
2 1/4% Cr—1% Mo.

## REDUCING LONG RADIUS 90° ELLS

Nominal Pipe Size	Maximum Wall Thickness
30	2.000
26	*
24	2.000
20	2.000
18	2.000
16	1.500
14	1.750
12	2.250
10	2.000
8	1.750
6	1.000
5	.625
4	.750
3	.625
2 1/2	.375
2	.500

Reductions to all nominal pipe sizes down to 1/2 large diameter. All thicknesses less than those shown above are, of course, available.

\*Refer to factory.

The exclusive Midwest method of making all welding elbows from plate, instead of tubing gives us a FLEXIBILITY OF MANUFACTURE that is much greater than by any other process. These heavy wall Midwest straight and reducing elbows are available in any material that can be secured as plate. The maximum wall thicknesses for which we now have equipment are indicated by the tables at left and right. And, because it is easier to get plate than tubing, better delivery is another advantage. Still another is the close tolerances inherent in our process.

Quality control goes beyond all code requirements. The longitudinal weld of every heavy wall elbow is completely X-rayed as standard procedure in our method of manufacture.

You will find it to your advantage to send us your inquiries.

## MIDWEST PIPING COMPANY, INC.

Main Office: 1450 South Second St., St. Louis 4, Mo. • Plants: St. Louis, Clifton, N. J. and Los Angeles

### Sales Offices

ASHEVILLE (BOX 446, SKYLAND, N.C.)  
BOSTON 27—426 FIRST ST.

CHICAGO 3—79 WEST MONROE ST.  
CLEVELAND 14—616 ST. CLAIR AVE.

HOUSTON 2—1213 CAPITOL AVE.  
LOS ANGELES 33—520 ANDERSON ST.  
MIAMI 34—2103 LE JEUNE RD.

NEW YORK 7—80 CHURCH ST.  
ONEIDA, N.Y.—282 NORTH MAIN ST.  
PITTSBURGH 19, PA.—437 GRANT ST.  
SAN FRANCISCO 11—430 MARKET ST.

STOCKING DISTRIBUTORS IN PRINCIPAL CITIES

**OPENS  
BALE OF  
JUTE CUTTINGS  
IN 8  
SECONDS**



## TAYLOR-STILES BALE BREAKER

In less time than it takes you to read this sentence, Taylor-Stiles Bale Breakers open a bale of tightly packed jute. Specifically, it opens a bale in less than 8 seconds. Only, one operator is needed to operate Taylor-Stiles Bale Breakers. He fetches the bales from storage, cuts the ropes of the bales, places the bales on the feed conveyor, and starts the feed conveyor. From this point it only takes 5 to 8 seconds to actually consume the bale!

Speed is not the only asset of this fine Bale Breaker. Since only one operator is needed, manufacturers have found that up to 7 men per shift can

be saved over manual opening methods. With direct labor accounting for almost 65% of all manufacturing cost, this is an important saving.

Apart from the saving in labor and other indirect savings, one of the most important advantages of the bale breakers in the words of the general manager of one plant is that "it has turned an inhuman operation, into a push-button job."

Whether you are interested in opening bales of jute cuttings, cork, rags, bagasse, cotton linters, straw, or similar products you, too, will find a Taylor-Stiles Bale Breaker will save you money.

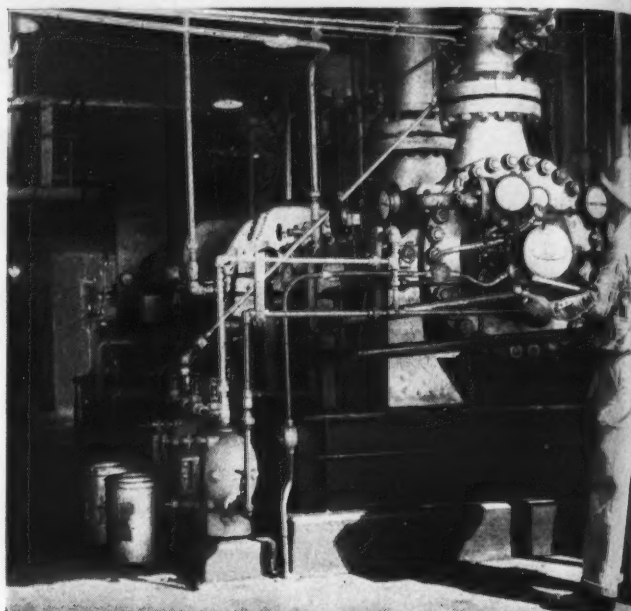
See us at the Chem. Show Booth 1357. Coliseum, N.Y.C., Dec. 2-6.

**TAYLOR, STILES & CO.**  
20 Bridge Street  
Riegelsville, N.J.

**Send today for our NEW  
BALE BREAKER FOLDER  
APP. 215 illustrating  
and describing Taylor-  
Stiles Long and Short Fi-  
bre Bale Breakers.**

Check 2190 opposite last page.

## PLANT ENGINEERING & MAINTENANCE



Compressor handles 3 to 4 million scfh of hydrogen in one sixth space that would be necessary with conventional compressing equipment. Enclosed, N<sub>2</sub>-blanketed motor, fluid drive, and speed increaser can be seen in background

UOP Platforming process is first catalytic reforming method to successfully employ a platinum-containing catalyst. At The Texas Co., Lockport Works, to recirculate hydrogen-rich gas it was found that ...

## centrifugal compressor cuts space requirements to 1/6

**THEODORE W. WETT**  
Assistant Editor  
**R. R. DEMOCK**  
Chief Power Engineer  
The Texas Company  
Lockport, Illinois

**Problem:** Hydrogen recycle in the Platformer at The Texas Co., required compression and recirculation of 3 to 4 million scfh of H<sub>2</sub>-rich gas. Ordinarily compressor installations of this size are large and tend to be noisy. They are sometimes a source of complaints when

plants are located in close proximity to residential areas.

Platforming is a continuous operation and equipment runs 24 hrs a day. Breakdowns are costly and in many installations separate standby compressors are provided to insure continuous production.

Hydrogen serves an important role in Platforming process by minimizing fouling of catalyst by carbon buildup. Low-octane gasoline is fed to Platformer at rate of 10,000 barrels per day. Six principal reactions occur simultaneously during Platforming: dehydro-



generation of C<sub>6</sub> ring naphthenes; isomerization of C<sub>6</sub> to C<sub>6</sub> ring naphthenes and their dehydrogenation to aromatics; dehydrocyclization of paraffins; hydrocracking; isomerization of paraffins; and desulfurization. Resulting product is high octane component of gasoline for modern high-compression automobile engines.

Concentration of hydrogen varies during a run. At startup it is close to 100%. During final stages of a run it drops to a little over 80%. H<sub>2</sub>S content in hydrogen-rich stream during a run is usually about 10 grains per 100 cu ft. Compression ratio is 1.3 to 1.4.

**Solution:** When Universal

stream from lubrication system is accomplished by a sleeve seal. Eight-stage compressor rotor consists of a balancing piston and eight closed impellers of K-monel metal. Diaphragms, supported by inner shell, serve as partitions between various stages and also form passages to direct flow from one impeller to next.

**Results:** Centrifugal unit does the job that would require almost six times the floor space if conventional reciprocating compressing equipment were used. Operation has been quiet and dependable so that processing schedules can be kept without the need for a standby unit. Twice-a-year overhaul

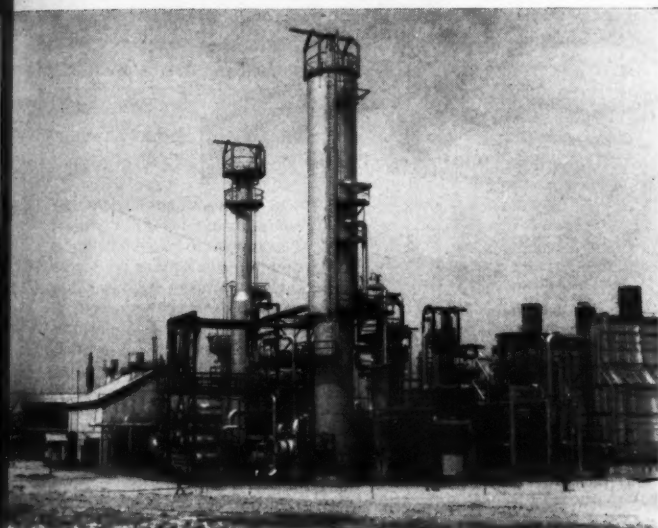
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SSING



UOP Platforming unit at The Texas Co. Compressor is housed in building at left

Oil Products Company's Platforming process was installed at The Texas Co. in 1955 a barrel-type, multi-stage, centrifugal compressor was selected to handle hydrogen-rich stream. Unit operates at 8000 to 9500 rpm. It is driven by a N<sub>2</sub>-blanketed, 1750-rpm, 3000-hp electric motor connected through a fluid drive and speed increaser.

Outer casing is a single cylindrical forging bored to receive a horizontally split inner shell. Inlet and discharge nozzles are welded to outer casing. Separation of gas

is sufficient to maintain continuous operation.

Single-forging, outer casing design, with only end cover sealing necessary, is an added safety feature in handling low-viscosity, low molecular weight hydrogen.

(Centrifugal compressor was supplied by Carrier Corp., Syracuse 1, N.Y.)

Check 2191 opposite last page.



## MORRIS meets the CHALLENGE of INDUSTRY'S NEW FRONTIERS

No Matter What Your Present or Future Heavy Pumping Problems Are . . . Morris Can Satisfy You NOW!

The new Morris Type RX Slurry Pump is specifically engineered to handle the viscosities, densities and special characteristics of the slurries and sludges developing from industry's ever-advancing products. It is engineering attuned to the future . . . designed to meet the demands of a towering tomorrow.

**Rugged, Dependable, Trouble-Free; Operates With Minimum Attention . . . Cuts Maintenance Costs!**

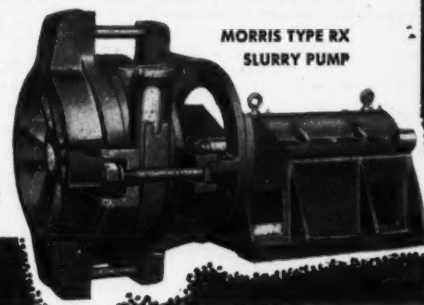
The new Morris RX is designed for performance perfection under all conditions, including heavy, coarse, fine slurries, dispersions and sludges. Operates at low speeds; quickly dismantled for inspection, avoiding lengthy lay-up time.

### MORRIS MACHINE WORKS

Baldwinsville, N. Y. Sales Offices in Principal Cities

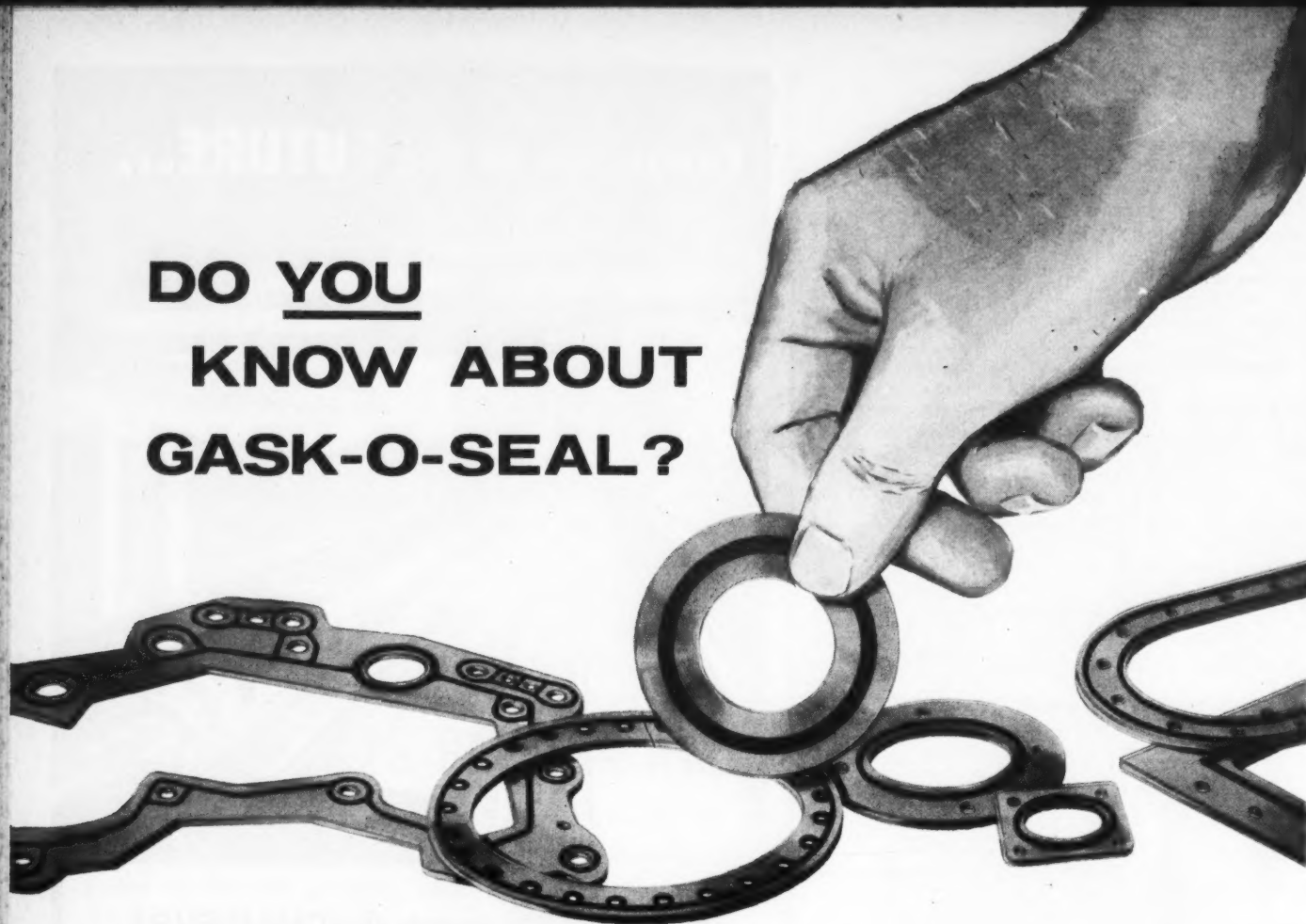
**FREE SERVICE:** Morris engineers will gladly recommend the custom-made pump best suited to your needs. Send necessary data today.

**MORRIS**  
CENTRIFUGAL  
PUMPS

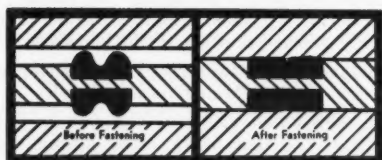


Check 2192 opposite last page.

# DO YOU KNOW ABOUT GASK-O-SEAL?



## The static seal that can not blow out!



The above diagram is "typical" only. Gask-O-Seals are also made with one-side seals.

If you do not know about Gask-O-Seals look at these facts:

- ✓ Gask-O-Seals will seal practically any processable fluid . . .
- ✓ Gask-O-Seals can be re-used . . .
- ✓ Gask-O-Seals will seal at low or high pressures, vacuum or positive . . .
- ✓ Gask-O-Seals are available as standards and as specials in almost any configuration or to meet special requirements.

They are recommended for flanges, gear boxes, transfer cases . . . any place where truly efficient static seals are needed.

*Note: A recent development of the Gask-O-Seal principle indicates effective sealing in the temperature ranges of  $-400^{\circ}$  to  $+1000^{\circ}$  for specific applications.*



## FRANKLIN C. WOLFE CO.

Culver City, California

"sealing design specialists"

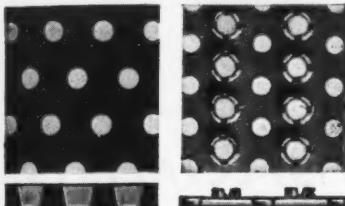
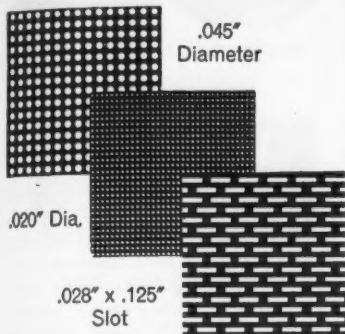
A DIVISION OF **Parker** APPLIANCE COMPANY  
Hydraulic and fluid system components

For more information on product at left, specify 2193 see information request blank opposite last page.



# H & K Perforated Screens

**CORROSION RESISTANT  
MADE FOR LONG LIFE**



We are well-experienced in the perforating of screens in stainless steels, monel metal and other alloys.

Screens can be cut to shape or size with margins or unperforated areas as required. Perforated screens can be furnished in practically any material from foil thin to 1" thick.

Contact either H & K office or one of our agents. We will be glad to work with you on your perforated screen requirements.

**FILL IN AND MAIL  
COUPON TO OFFICE  
AND WAREHOUSE  
NEAREST TO YOU.**



## THE Harrington & King PERFORATING CO. INC.

Chicago Office and Warehouse 5636 Fillmore Street Chicago 44, Ill. New York Office and Warehouse 110 Liberty Street New York, N.Y.

Please send me—

- ☐ GENERAL CATALOG NO. 62  
☐ STOCK LIST of Perforated Steel Sheets

NAME \_\_\_\_\_  
TITLE \_\_\_\_\_  
COMPANY \_\_\_\_\_  
STREET \_\_\_\_\_  
CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_

Check 2194 opposite last page.

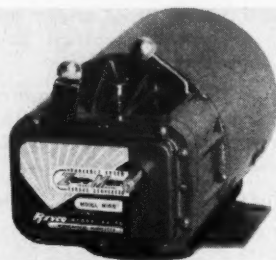
**Instant reversing of drive  
while running or stopped  
without reversing motor**

Uses: For reversing drive on output shaft.

Features: Instant reversing of drive is accomplished while running or stopped, with accurate speed repetition, without reversing motor.

Description: Motor consists of reversible, variable-speed reducer built onto GC 48-frame motor which drives reducer through 1:1 helical gears running in oil inside reducer housing. Package unit is reduced by a lever in top rear of housing which shifts reversing mechanism. Reversing motor does not reverse output shaft.

Output speed can be set from zero to 400 rpm. When



Motorized reversing unit provides instant reversing of output shaft while running or stopped

unit is reversed, the output shaft reverses direction instantly. Speed setting can be changed while unit is operating in either direction or in neutral. If different speeds in each direction are desired, these can be set manually or by remote control.

Complete package is only 5 3/4 x 5 3/8 x 10" minimum, excluding shafts. Standard 48-frame motor is 115 volts, 60 cycle, single-phase of open-frame, sleeve bearing, drip-proof construction. It can be operated in any position. Models delivering 10, 15, 20"-lb constant torque through their entire speed range to zero rpm are available.

(Motorized reversing unit is product of REVCO, Inc., 1900 Lyndale Ave. South, Minneapolis 5, Minn.)

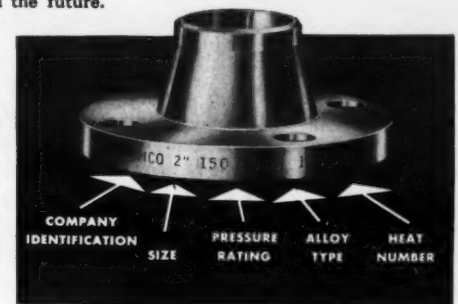
Check 2195 opposite last page.

# Quality... AT NEW COMPETITIVE PRICES!



Our continued specialization in the manufacture of stainless fittings and flanges has reduced manufacturing costs on our line of ASA stainless flanges and prices have been reduced to pass this savings on to you. The same quality standards maintained in the past will continue to be followed in the future.

All Camco ASA flanges have a heat code imprinted allowing positive identification with specific material used and covered by certificates of analysis on file. This information can be supplied on request without charge.



**One source for all your stainless steel fitting requirements**

## SCREWED • FLANGED • WELDING

If your distributor does not supply CAMCO quality flanges ask for the name of the nearest distributor stocking our flanges and fittings.

Send for your copy of Bulletin ASA-757 dated July 1, 1957 covering revised ASA flange prices.

Camco Products, Inc. 445 State Street North Haven, Connecticut

- ☐ Bulletin ASA-757  
☐ Catalog covering complete line  
☐ Name and address of nearest distributor

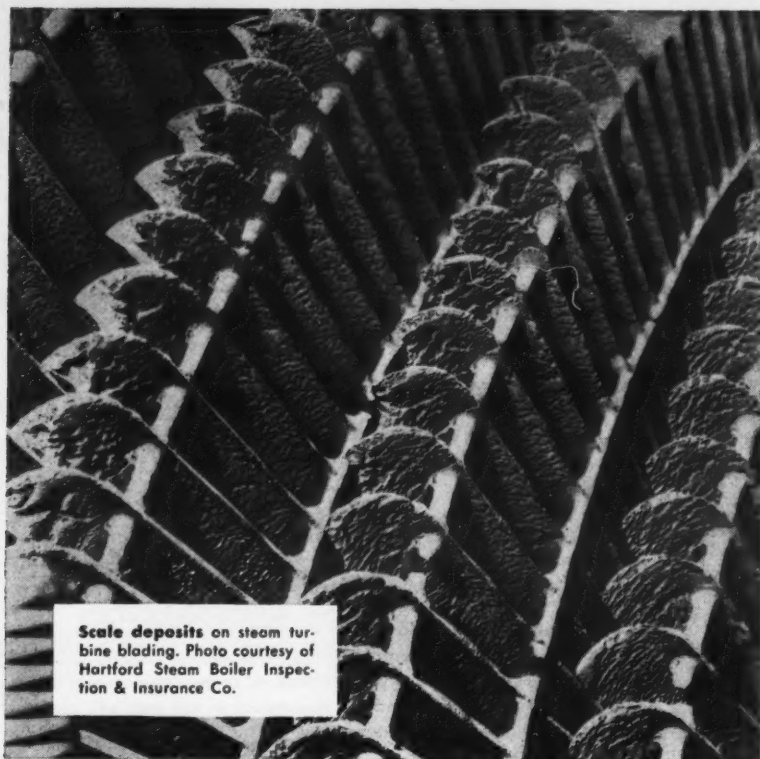
NAME \_\_\_\_\_  
COMPANY \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ ST. \_\_\_\_\_



**445 STATE STREET  
NORTH HAVEN, CONN.**

Check 2196 opposite last page.



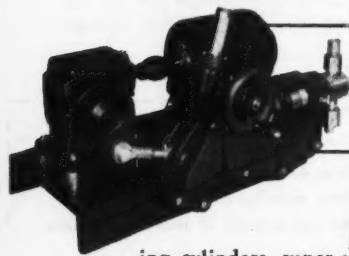


Scale deposits on steam turbine blading. Photo courtesy of Hartford Steam Boiler Inspection & Insurance Co.

## No Build-Up! No Blow-Up!

... WHEN MODEL 1106 PROPORTIONEER FEEDS BOILER WATER CHEMICALS

Prevent scale build-up (caused by boiler carry-over) on turbine blades with proper raw water or internal steam boiler treatment. Model 1106 Proportioneer feeds all chemicals (alkaline, neutral, or acid) accurately (guaranteed within  $\pm 1\%$ ) over 15 to 1 range. Capacities range from 0.11 to 35.6 GPH ... for discharge pressures up to 1100 psig.



In-Motion Stroke Adjustment offers the ultimate in convenience for controlled chemical feeding. Stroke length adjustable (no tools required) in stepless increments over entire range of pump while pump is in operation!

### PAY LESS, GET MORE!

Design features of this proportioning pump include interchangeable measuring cylinders, super-accurate Vane-Guide check valves, and percentage calibrated stroke-length scale.

Request Bulletin 1106-2 for complete data. Write to PROPORTIONEERS, INC., 387 Harris Avenue, Providence 1, Rhode Island.



**PROPORTIONEERS**

DIVISION OF

**B-I-F INDUSTRIES**



METERS  
FEEDERS  
CONTROLS

Check 2197 opposite last page.

## ENGINEERING

### Designed for critical suction, centrifugal pump has low NPSH

**Uses:** For circulation of liquids in air conditioning, refrigeration, coolant, hot water, chemical, and general purpose applications.

**Features:** Unit is designed to meet critical suction conditions, and possesses low NPSH characteristics.

**Description:** Close-coupled end-suction general-purpose pumps come in horizontal, close-coupled horizontal, pedestal-mounted, flange-mounted vertical, and base-mounted vertical units. Sizes range from 1/6 hp to 7 1/2 hp at 3500, 1750 (60 cycle), and 2880, 1440 (50 cycle) speeds AC or DC and all voltages and phases are available. Motors are NEMA standard, drip-proof, splash-proof, totally-enclosed, explosion-proof, and chemical as required.

(Centrifugal pump is product of Aurora Pump Div., The New York Air Brake Co., 62 Loucks St., Aurora, Ill.)

Check 2198 opposite last page.

### Plug-type valve has stainless seat and disc

**Uses:** For close throttling of steam, water, oil, or air where operation causes excessive wear to ordinary materials, or corrosive services tends to affect closure surfaces.

**Features:** Seats and discs are 500-plus Brinell hardened stainless steel.

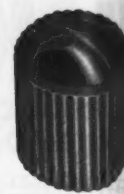
**Description:** Plug-type globe and angle valves come in both 150 and 200-lb working steam-pressure classes. Eight sizes from 1/4 through 2" are available. Valves have union bonnet at centerpiece joint. Hand-wheel is of aluminum alloy, and all other parts are made from bronze alloy or brass, meeting ASTM requirements. Seat and disc are removable.

(Plug-type valves are product of Ohio Brass Co., Mansfield, Ohio.)

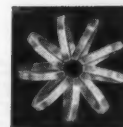
Check 2199 opposite last page.



Partition Ring



Spiral Ring



Plastic Tellerette



Lessing Ring



Raschig Ring



Ceramic Berl Saddle

## SPECIALISTS in Tower Packings

Here are several types of tower packing made in one of the Knight plants, the largest in the country specializing in tower packing production.

Knight packing includes the popular and efficient Berl Saddles made of unglazed porcelain and chemical stoneware. Both are sturdy, non-spalling and entirely acid proof. Berl Saddles, made of Permanite or steel, are available for use with strong caustic solutions or HF.

Knight makes other tower packings—including Raschig, Lessing, spiral, and partition rings. We also furnish the new polyethylene Tellerette packing shown.

Data concerning sizes, weights, surface area, etc., on our various types of tower packings is given in Knightware Chemical Equipment Bulletin No. 11—Write for your copy.

**Maurice A. Knight**  
4 Kelly Ave., Akron 9, Ohio

**KNIGHT-WARE**  
CHEMICAL EQUIPMENT

Check 2200 opposite last page.

CHEMICAL PROCESSING

### Flexible steel connectors are corrosion, pressure, and heat resistant

**Uses:** For eliminating pipe-line problems caused by rigid connections.

**Features:** Stainless steel connectors are corrosion, pressure, and heat resistant.

**Description:** Flexibility of connectors permits movement, compensates for misalignment, and dampens vibration. Connectors are available in all standard sizes through 4", in any required length, with any standard or special fittings or flanges for end connections.

("Allflex" stainless steel flexible connectors are product of Allied Metal Hose Co., 3735 Ninth St., Long Island City 1, N. Y.)

Check 2201 opposite last page.

### Titanium carbide alloys

Bulletin of 12 pages presents heat-resistant titanium carbide alloys and their many applications in chemical and other industrial equipment. Physical properties and corrosion resistance of 13 different compositions are tabulated and charted to show effects of temperature and time of exposure. Bul B-444 — Kennametal Inc., Latrobe, Pa.

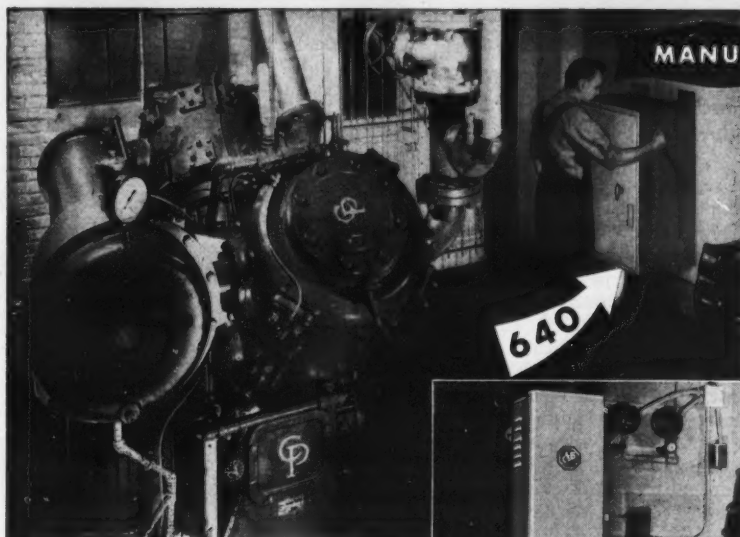
Check 2202 opposite last page.

### FOR MORE INFORMATION

Here's what to do when you want additional details about products and services mentioned in this issue's editorial articles or advertisements.

Note the number at end of article or advertisement. Check this key number on Reader Service Slip opposite last page of this issue. Fill in Slip with the other pertinent information (name, title, company, address, product made). Mail to our Reader Service Department.

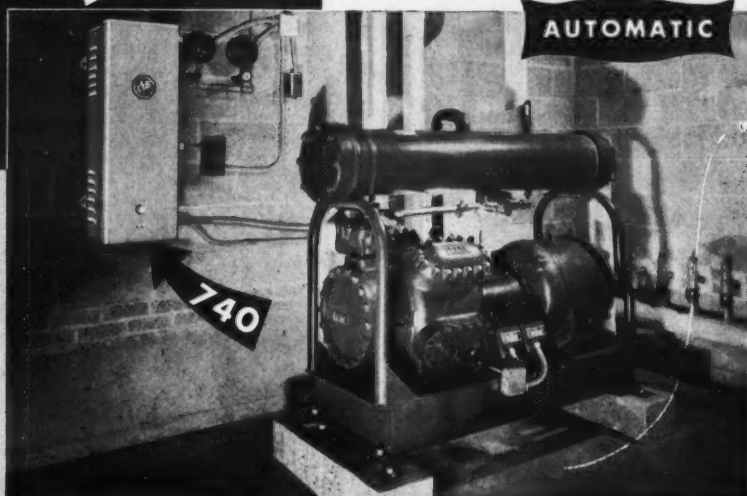
We'll contact the manufacturer for you. He'll send you the details direct.



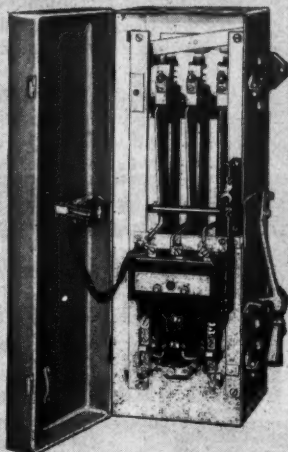
MANUAL

Large CP compressor equipped with Allen-Bradley Bulletin 640 resistance starter. Motor is speeded up by slowly raising starter lever. No current inrush—velvet smooth start.

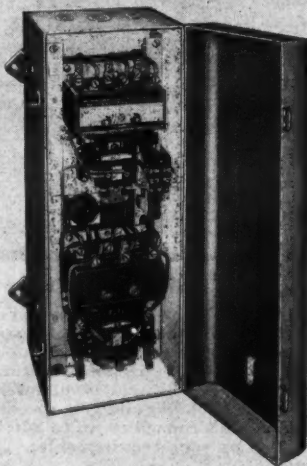
Trane air-conditioning compressor equipped with Allen-Bradley Bulletin 740 automatic resistance starter. Two-step starter smooths out current inrush—prevents lamp flicker.



AUTOMATIC



BULLETIN 640 manual starter with cabinet open to show the three starting compression resistors.



BULLETIN 740 automatic resistance starter. Starting resistors are located behind the two contactors.

## EASY ON THE LINE... EASY ON THE MOTOR

No jerks or jolts—Satisfies the power company

Allen-Bradley compression resistance starters afford a neat solution for smoothing out the starting current and torque of heavily loaded squirrel cage motors. Graphite disc resistors, available only in Allen-Bradley compression starters, control the starting current and torque with velvet smoothness . . . and without lamp flicker.

These jerkless starters prevent damage or undue stress on belts, chain drives, or gears. They are equipped with dependable and accurate overload relays.

Available for squirrel cage motors up to 200 hp, 220-440-550 v. Send for Bulletins 640 and 740, today.

Allen-Bradley Co.  
104 W. Greenfield Ave.  
Milwaukee 4, Wis.

In Canada—  
Allen-Bradley Canada Ltd.  
Galt, Ont.



**ALLEN-BRADLEY**  
SOLENOID MOTOR CONTROL  
QUALITY

Check 2203 opposite last page.



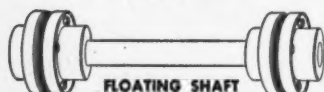
**FOR MAINTENANCE FREE  
POWER TRANSMISSION**

**Specify**

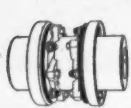
# THOMAS FLEXIBLE COUPLINGS



**DOUBLE FLEXING  
DBZ** — for high speed,  
heavy duty drives



**FLOATING SHAFT  
BMR** — for heavy duty service  
with excessive misalignment



**DOUBLE FLEXING  
AMR** — for engine  
and medium speed  
drives



**SINGLE FLEXING  
SS** — for engine-  
driven generator  
sets with out-board  
bearings

Thomas' 40 years of flexible coupling experience is at your disposal to help you meet ordinary applications or special variations for unusual cases.

**UNDER LOAD and MISALIGNMENT  
ONLY THOMAS FLEXIBLE COUPLINGS  
OFFER ALL THESE ADVANTAGES.**

- 1 Freedom from Backlash  
Torsional Rigidity
- 2 Free End Float
- 3 Smooth Continuous Drive with  
Constant Rotational Velocity
- 4 Visual Inspection While  
in Operation
- 5 Original Balance for Life
- 6 No Lubrication
- 7 No Wearing Parts
- 8 No Maintenance

Write for Engineering Catalog 51-A

**THOMAS FLEXIBLE  
COUPLING CO.**

WARREN, PENNSYLVANIA, U. S. A.

Check 2204 opposite last page.

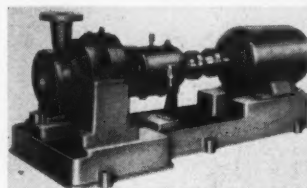
## ENGINEERING

**Standardized pump parts  
reduce field inventory**

**Uses:** For heavy-duty pumping service.

**Features:** Standardized parts provide maximum interchangeability, permitting substantial reductions in field parts inventory.

**Description:** Vertically split centrifugal pump is constructed with centerline supported casings and circular casing joints with confined gaskets. Pump is best used for temperatures up to 850°F. Casing thicknesses have been designed to safely withstand



Centrifugal pump has standardized parts permitting maximum interchangeability

working pressures up to 600 psig with an economical 1/8" minimum corrosion allowance. Pump shafts and bearings are sized for minimum deflection to provide trouble-free service under difficult suction conditions up to 500 psig. Pumps are available in end suction, top discharge; top suction, top discharge; or integral seal models.

(HN pump is product of Worthington Corporation, Dept. CP, Harrison, N.J.)

Check 2205 opposite last page.

### Valve catalog excels

Catalog of 244-pages, reported to outdo its predecessor, contains simplified presentation of useful data on manufacturer's line of check and gate valves. Reference data on materials, specifications, and standards are included in this well-illustrated and diagrammed catalog. Cat 57—Darling Valve and Mfg. Co., Williamsport, Pa.

Check 2206 opposite last page.

**NEW! TROY**

**DUPLEX  
DISPERSER\***

**Produces  
Finished Product  
in One Operation**



\*Trademark

Troy's new compact unit combines a powerful disperser head with the rugged diamond-shaped agitator to produce finished homogeneous batches **without further milling** — for the majority of present inks and paints.

Modern design gives proportional hydraulic shear, kinetic impingement and mulling action for better wetting, improved color dispersion and uniform blending. Send samples for trial processing.

Write Troy for details of special Capital-Purchase plan.

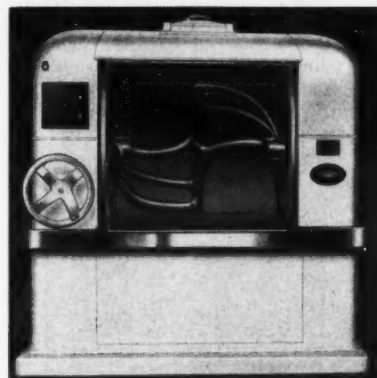
**TROY**

Engine & Machine Co.

706 Parsons Street  
Troy, Pennsylvania

Check 2207 opposite last page.

## CHAMPION'S famous Sigma Spiral



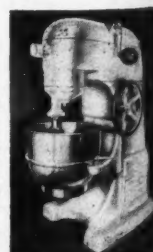
**MIXING AGITATOR**

**... for fast, intimate, uniform mixing**

SIGMA ARM may solve your mixing problem . . . it has powerful, efficient action, necessary for handling heavy, viscous ingredients. It blends and incorporates the different materials in a homogenous mixture with economical use of power. The Sigma Arm is an integral feature of the Champion Type H single and two speed mixers shown above. Several sizes with capacities up to 240 gallons, adapted for many uses. Tell us your requirements . . . we'll send you complete details.

**CHAMPION MACHINERY CO., JOLIET, ILL.**

Makers of a full line of modern popular-priced bakery equipment and special mixers



Champion line of Vertical Mixers made in capacities from 20 to 110 quarts . . . 3 and 4 speeds.

Check 2208 opposite last page.

CHEMICAL PROCESSING



R\*  
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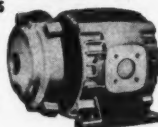
For more information on product at right, specify 2209 see information request blank opposite last page.



## U.S. TOTALLY-ENCLOSED MOTORS

### Protected AGAINST CORROSION ALL EXPOSED PARTS CAST IRON...

Rust-resistant solid cast iron withstands abuse, wear and corrosion. *Protects* working parts!



### Protected AGAINST INTERNAL HEAT WITH ASBESTOS WINDINGS

Nature's greatest heat resistor, asbestos can't carbonize! *Protects* windings against heat!



### Protected BY LUBRIFLUSH FOR LONGER BEARING LIFE

New grease forces old grease out—keeps bearings fully lubricated. *Protects* bearing efficiency!



### Protected FROM STRESS AND WARP BY NORMALIZING CASTINGS...

All cast-iron components are heat-seasoned to stabilize molecular structure. *Protects* against warp!



### Total Protection in every direction

Large savings are being gained by many industries using *enclosed* motors in place of the usual "open" or ordinary protected motor. U.S. Totally Enclosed gives *total* protection in every direction—from corrosion, dusts, abrasives, impact, weather, spray and splash! This means motor dependability...long life...savings both on motor costs and production continuity!

MAIL COUPON NOW ▼

# U.S. Electrical MOTORS



U.S. ELECTRICAL MOTORS, Inc.  
Los Angeles 54, Calif.—Box 2038, Milford, Conn.

PE-9

Gentlemen: Please send me complete information in your Totally-Enclosed Motors.

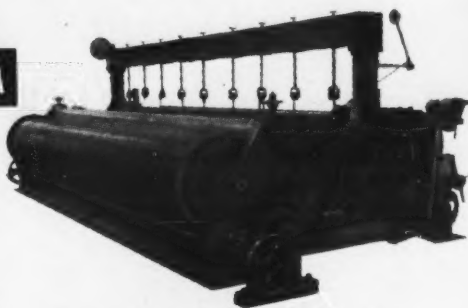
NAME \_\_\_\_\_  
COMPANY \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_

# NEW IDEAS and BETTER MEANS for SOLIDS-LIQUID SEPARATION

At the forthcoming Chemical Exposition we'll be happy to discuss your problems in relation to our research work and developments in metallic filter media, filter leaves, screens and special fabrications for better processing.

## NEW FILTER MEDIA

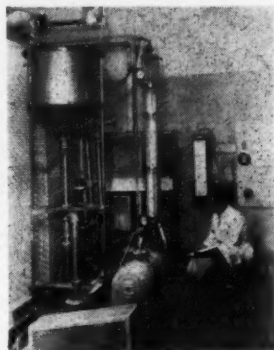
To the extensive line of metallic fabrics, woven on our own modern looms, we have added "Micromesh"—an ultra-fine weave cloth with particle retention as low as 10 microns. You'll also want to investigate "Neva-Clog" perforated sheet metal and "Mykro-Pore" electro-deposited filter medium.



"Bambino" weaves cloth 244" wide. This is but one of many Multi-Metal looms.

## MORE RESEARCH IN PROGRESS

Investigations continue in our own laboratory and in the field on cloth structures, their characteristics, capabilities, flow rates and particle retentivity. These data are available to help you.



Multi-Metal's laboratory carries on research and solves customers problems.

## BETTER PROCESS UNIT COMPONENTS

Filter leaves, notably "Rim-Lok," tubular filter elements, strainers, filter-strainer units, screens and other processing components and complete apparatus—Multi-Metal designed and built better than ever—merit your careful study.

Come see us at Booth 191 or write for specific information.



Stainless steel concentric cylinder assembly for refinery

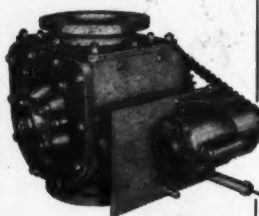


"Rim-Lok," the most efficient leaf for vertical and horizontal leaf filters.

**MULTI-METAL WIRE CLOTH CO., INC.**  
1336 GARRISON AVENUE NEW YORK 59, N. Y.

Check 2210 opposite last page.

## HERE'S THE ROTARY FEEDER PROCESS ENGINEERS ASKED FOR



**SPECIAL FEATURE!** If obstruction encountered, added tension on chain drive causes motorsupport to swivel and actuate limit switches. Motor reverses, reverses again and "rocks"—literally "chopping up" obstruction.

See the Rotary Feeder in operation at the Chem Show—Booth 1359



GET THE FULL STORY, SEND FOR DATA SHEET DIV

### Check these Rotary Feeder features:

- 1 Positive feed. Positive measure provided by rotor bucket and shoe design and constant rotor speed.
- 2 Adjustable contact between rotor and shoe. Wear take-up screws permit adjustment to compensate for wear, maintain tight seal.
- 3 Easy maintenance. Only wearing parts, rotor and shoe, are renewable without dismantling piping.
- 4 No flooding. Single contact of rotor and shoe provides effective seal. Ample clearance between rotor and housing permits free flow.
- 5 Easily installed. Self-contained unit has only two points of attachment.

If these features mean as much to you as they do to your engineering associates who asked us to produce this feeder, you will want full details.

the **Allen-Sherman-Hoff** company

257 E. Lancaster Ave., Wynnewood, Pa.

Offices and representatives in principal cities

**MATERIALS HANDLING EQUIPMENT**

Check 2211 opposite last page.

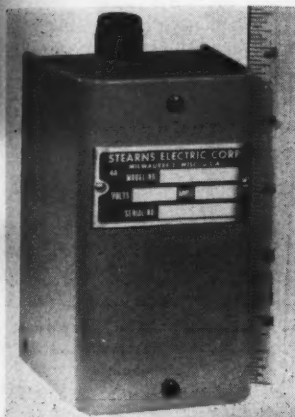
CHEMICAL PROCESSING



**Compact silicon rectifier  
only 4 3/4" high, 3" wide**

**Uses:** For supplying direct current from alternating current source in power transmission equipment applications.

**Features:** Space saving rectifier unit is only 4 3/4" high and 3" wide.



Space saving silicon rectifier is compact and durable

**Description:** Silicon rectifier is suitable for 110 volt AC input, 90 volt DC output, with a .9 amp capacity.

(Model 1Y silicon rectifier is product of Stearns Electric Corp., 120 N. Broadway, Milwaukee 2, Wis.)

Check 2212 opposite last page.

**Pump has longer stroke,  
75% higher capacity**

Lower horsepower required due to anti-friction bearing

**Uses:** For handling pulp and similar materials.

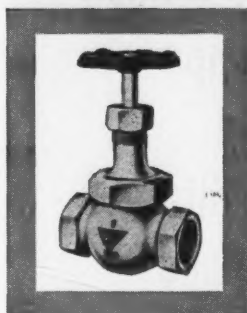
**Features:** Unit has longer stroke and up to 75% higher capacity. Lower horsepower is required because anti-friction bearing design practically eliminates friction and reduces maintenance.

**Description:** Adjustable stroke diaphragm pump is only 50" high. Capacities to 70 gpm for simplex and 140 gpm for duplex at hp of 3/4 to 1, depending upon specific gravity of pulp, are offered.

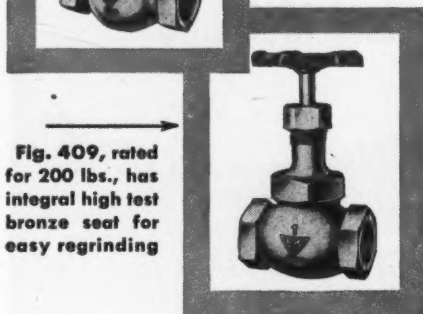


# R-P&C Valves

## DESIGNED FOR DEPENDABILITY



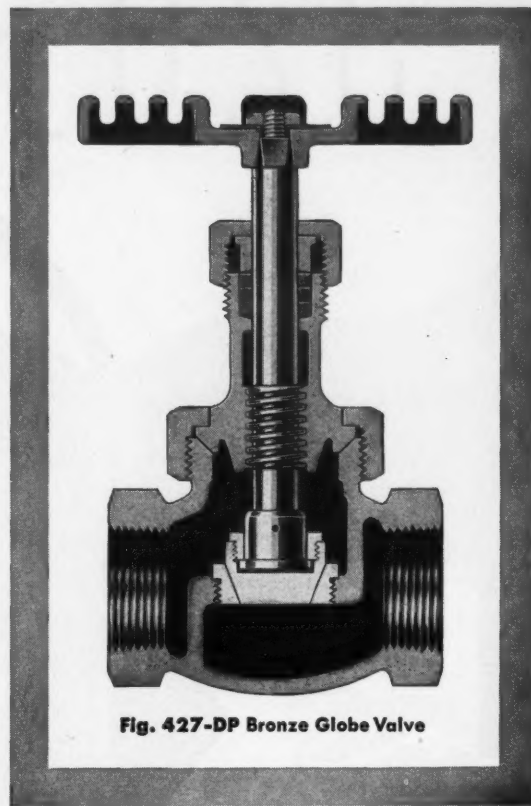
**Fig. 1-A, rated for 150 lbs., has special asbestos composition disc for tight shutoff**



**Fig. 409, rated for 200 lbs., has integral high test bronze seat for easy regrinding**



**Fig. 033 Angle Valve, rated for 125 lbs., has integral seat, re-grinding type disc**



**Fig. 427-DP Bronze Globe Valve**

## R-P&C Distributors offer 9 different models of Bronze Globe Valves—What are your requirements?

• You can select the R-P&C globe or angle valve to meet your particular requirements from a wide variety of seat and disc constructions, with union or screwed bonnet, screwed ends, in pressure classes from 125 to 300 pounds. Your R-P&C distributor offers 9 different bronze globe valves, each in a complete range of sizes—and 8 different models of angle valves which duplicate the construction features found in the globe valve line.

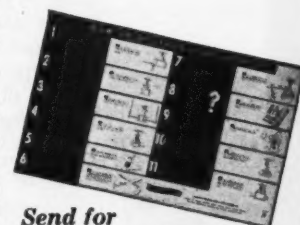
For example, if your application calls for frequent or continuous throttling in

steam, water, oil or gas service, the Fig. 427-DP shown above is probably your best bet. The full plug construction gives you closer regulation. And the 500 Brinell stainless steel seat and disc resist wire drawing—give you much longer valve life.

Your R-P&C distributor can recommend the specific valve to answer your particular problem. And he has an equally wide selection in R-P&C's complete line of angle, gate and check valves in iron and cast steel, as well as forged steel gate valves. See him today.

### R-P&C Valve Division AMERICAN CHAIN & CABLE

Reading, Pa., Atlanta, Boston, Chicago, Denver, Detroit,  
Houston, New York, Philadelphia, Pittsburgh, San Francisco,  
Bridgeport, Conn.



**Send for  
this free wall chart  
"How to Protect Your Valves"**

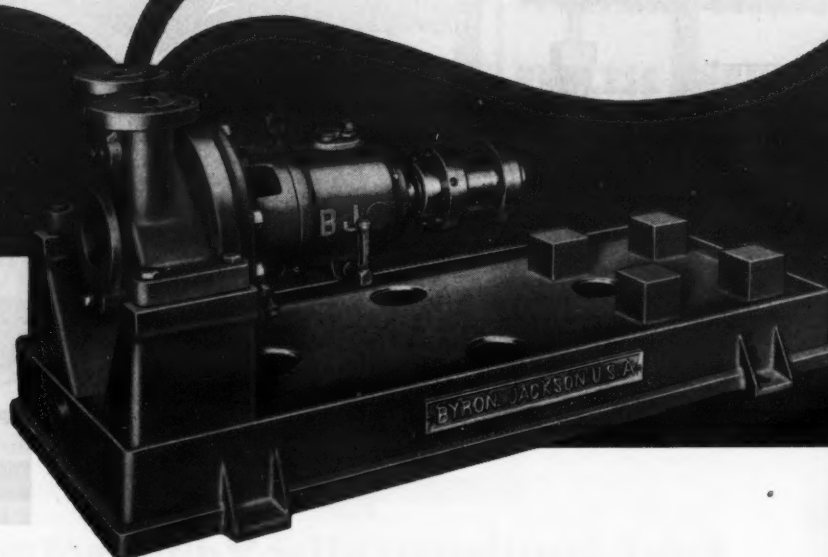
• 22 in. x 17 in. wall chart tells how to protect valves, get longer valve life—gives installation and operation pointers. Write for your copy.

Check 2213 opposite last page.



# -320°F

Now  
a complete line  
of BJ Pumps  
for Liquid  
Oxygen, Nitrogen  
and Methane!



BJ offers a complete line of dependable horizontal cyrogenic pumps with BJ Lo-Temp Mechanical Seals for pumping such liquids as oxygen, nitrogen and methane.

Designed to handle liquids at temperatures as low as minus 320° F. with capacities to 3500 gpm against total heads to 1600 feet, this dependable standard line of pumps answers all low temperature requirements of liquid oxygen, nitrogen, methane pump users.

Only Byron Jackson combines years of knowl-

edge in the two areas vital to creating a fully dependable pump and seal for this service: (1) years of engineering and (2) unchallenged leadership in the development of mechanical seals to assure reliable stuffingbox operation. This means that now you can get—on standard order—pumps to answer any sub-zero liquid handling requirements.

See your local Byron Jackson Pumps office for details or write for "BJ Pumps for Liquids at Sub-zero Temperatures."

## BYRON JACKSON PUMPS

INCORPORATED

A Subsidiary of Borg-Warner Corporation

BOX 2017A, TERMINAL ANNEX • LOS ANGELES 54, CALIFORNIA

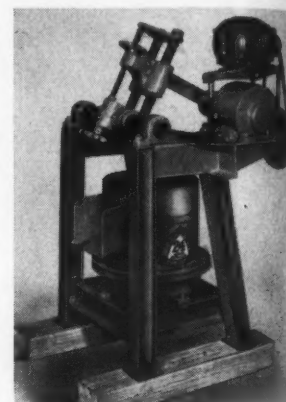
SINCE 1872



Send for this  
informative  
file...

### ENGINEERING

Standard ball-bearing motor is used to drive speed reducer. Molded-rubber, nylon-cord diaphragm forms true catenary curve which distributes flexing over entire surface. Diaphragm assembly can be re-



Adjustable stroke diaphragm pump is only 50" high, has 75% more capacity

moved from front or rear of pump by removing only four bolts.

Bayonet type or ball valves are optional.

(Adjustable stroke diaphragm pump is product of Denver Equipment Co., Dept. CP, PO Box 5268, Denver 17, Colo.)

Check 2215 opposite last page.

### Precision throttling valve features low torque, self-aligning seat

Variety of port sizes with only two body configurations

**Uses:** For oils, fuels, and other liquids compatible with aluminum and steel in central hydraulic systems. Units can be provided in other materials for service applications such as water, acids, and other corrosive liquids.

**Features:** Valves have low torque and self-aligning seats. Total of 668 porting combinations can be accomplished with only two basic body configurations.

**Description:** Lightweight valve, with all-aluminum body, is available with female pipe thread, female brazed tube

Check 2214 opposite last page.

fitting, and J.I.C. threaded parts.

Valve body can be removed without breaking line. Valve seat replacement can be accomplished without removing body from line.

Easy-to-maintain valves use standard O-ring seals, integral valve stem and poppet of hardened, ground, and polished steel, and valve seat of hardened ball-bearing steel.

(Precision throttling valve is product of Greer Hydraulics, Inc., Dept. CP, New York International Airport, Jamaica 30, New York.)

Check 2217 opposite last page.

#### Ceramic fiber withstands plus 2000°F temperatures

Available as rope, cloth, tape, and other textile forms

**Uses:** As insulation, gasketing, filter media, protective clothing, conveyor belts, heat and flame barriers, and other high temperature applications where flexible sheet material is required.

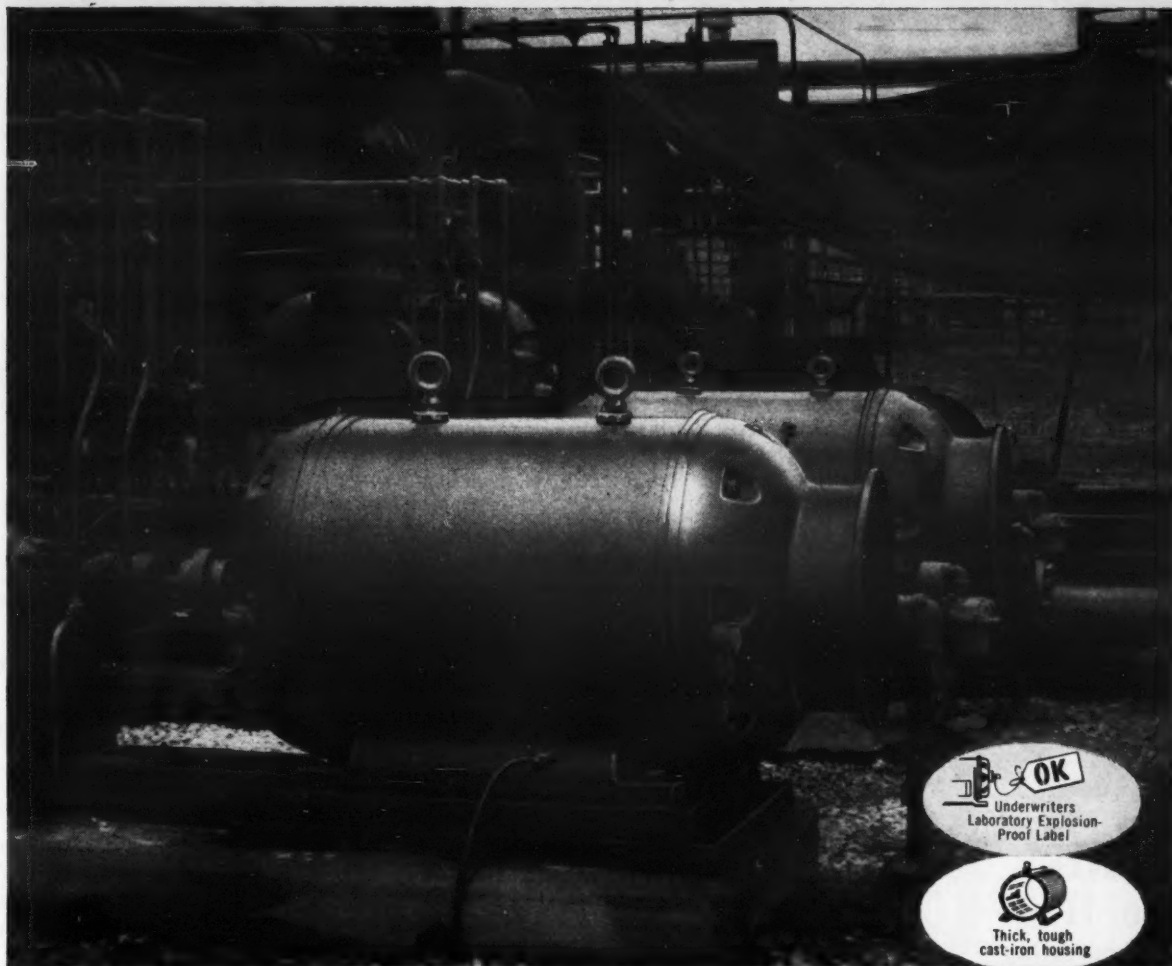
**Features:** Material withstands temperatures in excess of 2000°F. It is available as roving, yard, cord, rope, woven tape, broadwoven fabrics, and other textile forms.

**Description:** Aluminum silicate fabrics cover wide range of weights from 15 to 74 oz./sq yd. They are made from staple fiber yarns in variety of weaves and constructions. Material has outstanding insulating properties due to low thermal conductivity, high yarn bulk, natural resilience, and small fiber diameter (average about 4 microns). Approximately 15% organic fiber is used in making ceramic fiber textiles.

Roving and yard are available in size ranges of 600 to 1000 yd/lb. Rope ranging in diameter from 1/4 to 3/4" is being used as insulation and packing in various metallurgical refining processes.

(Fiberfrax ceramic fiber is available from the Carborundum Co., Niagara Falls, N.Y.)

Check 2218 opposite last page.



## Tough-shelled, explosion-proof, and corrosion-resistant

### New Improvements In Louis Allis explosion-proof motors meet latest demands of abusive chemical service

You need tough-shelled, explosion-proof motors in the corrosive, volatile atmospheres of many of today's modern chemical processing plants.

For this rugged use, Louis Allis, the *originator* of the fan-cooled explosion-proof motor, has continued to develop new designs of direct benefit to the chemical industry: Cast-iron housings with extra-high corrosion-resistance—special varnishes that provide maximum insulation against moisture, acids, and alkali—more effective cooling with aerodynamically designed non-sparking fan.

EP-184

Now, to match increasing industry demands, Louis Allis offers explosion-proof motors in the *large* sizes — up to 600 horsepower.

What's more, these motors are available in a wide range of mechanical modifications and electrical characteristics to meet special requirements.

See the complete story in our Bulletin 80G, "Explosion-Proof Motors." Contact your Louis Allis District Office, or write today to the Louis Allis Company, 448 East Stewart Street, Milwaukee 1, Wisconsin.

## LOUIS ALLIS

MANUFACTURER OF ELECTRIC MOTORS AND ADJUSTABLE SPEED DRIVES

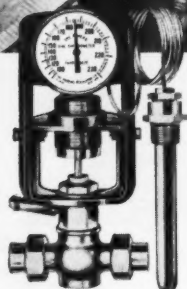
Check 2219 opposite last page.

# VISIBLE PROOF

of constant  
temperature control



with  
**POWERS  
No. 11**  
self-operating  
temperature  
regulator



This big four-inch dial gives a quick, visual means of checking controlled temperatures... an accurate guide for regulator adjustment.

Designed for precise temperature control, the Powers No. 11 Regulator is self-powered... simple, compact and dependable. Full throttling action is gained without the aid of any external power source. Special valve stem lubricator eliminates binding. Big double ply metal bellows provide extra valve power—longer life. Union body assures easy installation.

For specifications, valve sizes, types and temperature ranges, call your Powers branch office—engineering services in 66 cities. Write for Bulletins Nos. 329 and 330. The Powers Regulator Co., Dept. 1157, Skokie 16, Ill.



**POWERS**  
TEMPERATURE CONTROL

Check 2220 opposite last page.

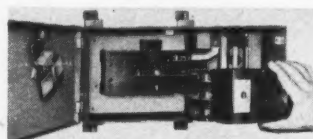
## ENGINEERING

**Plug-in circuit breaker  
used for wide range  
of bus duct ratings**

Uses: As circuit breaker.

Features: Single, bus duct plug-in disconnecting unit can be used for all ratings from 15 amps — 250 volts to 100 amps — 600 volts.

Description: Enclosures are supplied with an interlocking cover that prevents opening when breaker is in "on" position. Positive handle mechanism, that may be padlocked,



Circuit breaker unit can be used for wide range of bus duct ratings

plainly indicates "on", "off" or "tripped" breaker position. Wiring is simplified through use of solderless connectors and ample wiring space in enclosure. Neutral plug for use on three-phase, four-wire circuits is available as accessory.

(Plug-in disconnect unit is product of Federal Pacific Electric Co., 40 Paris St., Newark 1, N.J.)

Check 2221 opposite last page.

**All AC motor controls  
centered in one group,  
and interchangeable**

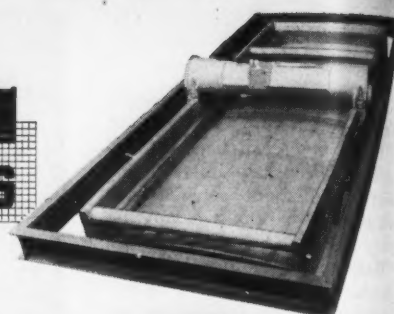
Uses: As control center for groups of 3-phase AC systems at 220 volts (1-100 hp), and 600 volts (1-200 hp).

Features: All controls are centralized in one group of stationary, interchangeable enclosures.

Descriptions: Control centers for groups of AC motors are individual structures 90 3/4" high and 20" wide. They may be combined in straight line, L-shaped, or U-shaped assemblies. Each interchangeable enclosure has grouping of modular starter units. Enclosures are available for front mounting and back to back mounting of controls, NEMA

**Derrick**  
VIBRATING MOTOR  
**Screens**

**HIGH  
FREQUENCY  
and AUTOMATION  
in SCREENING**



OPEN AND  
CLOSED VIEW  
MODEL 36-96A-4

AVAILABLE in open, totally enclosed, wet or hopper type models (sizes up to 3 feet wide and 8 feet long. Steel, aluminum, stainless).

UNIFORM — high speed centrifugal action produces maximum efficiency, minimum blinding.

EFFECTIVE RANGE — 2 to 325 mesh wet or dry.

RUGGED — totally enclosed vibrating motor, contamination-free... no exposed moving parts... low power requirements.

SPACE SAVING—heavy duty machines are quiet, flexible in design and transmit no vibration externally.

WRITE FOR COMPLETE INFORMATION

**Derrick Manufacturing Co.**

591 DUKE RD., Buffalo 25, N.Y.

Phone: REgent 9010

Check 2222 opposite last page.

**USING SCREEN SEPARATIONS?  
NOTHING CLASSIFIES AS  
PERFECTLY AS AIR**



**UNIVERSAL ROAD MACHINERY CO.**  
117 Liberty St., New York 6, N. Y.

Factory and Laboratory: Kingston, N. Y.  
In Canada: Watson-Jack Hopkins Ltd., Montreal

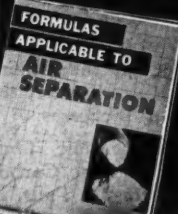
Robert M. Gay Division

**GAYCO**  
CENTRIFUGAL  
AIR  
SEPARATORS

Classify practically all dry fine materials

You get:

- CLOSER SEPARATIONS
  - IMPROVED PRODUCTION
  - NO UNDESIRABLE OVERSIZE.
- RANGE 60 to 400 mesh.  
Timken bearings.  
Choice of Standard or Heavy-Duty Models.



this  
helpful  
booklet  
sent  
on  
request

Check 2223 opposite last page.

CHEMICAL PROCESSING

1 indoor or weather-resis

Each structure horizontal 3-er 12" from vertical bus power to sta units are av Type A w NEMA Type terminal bloc er, or NEMA dividual uni and complet to master t either the t each structur

(Control cen Westinghous PO Box 205 Pennsylvania

Check 2224

**Mercury la**  
to operate  
of 54 lumen

A 1500-w lamp that op ciency of 54 has been de ing large ou is reported t light output lamp of this duced for g Tubular in erates with usually asso of this type. ing serves a which also let radiatio lamp. Over is 19-9/16 nominal lig inches.

It has sin nal at each specially de base which length to p cooling for temperature 1500 watts, at 81,000 lu form effect tures as lo equipped w ("Mercury product of Co., Nela Ohio.)

Check 2225

NOVEMB



1 indoor or NEMA 3 outdoor weather-resistant enclosures.

Each structure contains main horizontal 3-phase bus, lowered 12" from top, and 3-phase vertical bus for distribution of power to starter units. Starter units are available in NEMA Type A with no terminal, NEMA Type B with individual terminal blocks on each starter, or NEMA Type C with individual unit terminal blocks and complete factory wiring to master terminal blocks at either the top or bottom of each structure.

(Control center is product of Westinghouse Electric Corp., PO Box 2099, Pittsburgh 30, Pennsylvania.)

Check 2224 opposite last page.

### Mercury lamp developed to operate at efficiency of 54 lumens per watt

A 1500-watt mercury quartz lamp that operates at an efficiency of 54 lumens per watt has been developed for lighting large outdoor areas. Lamp is reported to have the highest light output of any mercury lamp of this length ever produced for general lighting.

Tubular in shape, lamp operates without glass jacket usually associated with lamps of this type. A luminaire housing serves as protective jacket which also absorbs ultra-violet radiation produced by lamp. Overall length of lamp is 19-9/16 inches, giving it a nominal lighted length of 12 inches.

It has single contact terminal at each end fitted into a specially designed ceramic base which is slotted along its length to provide convection cooling for operation at high temperatures. Operating at 1500 watts, new lamp is rated at 81,000 lumens. It will perform effectively at temperatures as low as -20°F when equipped with proper ballasts.

("Mercury 1500" lamp is product of General Electric Co., Nela Park, Cleveland 12, Ohio.)

Check 2225 opposite last page.

## Can <sup>specialized</sup> business publication advertising actually sell?

By reputation, salesmen are reluctant to credit anything but their own selling efforts for getting names on the dotted line.

Actually, it's quite a different story. The most successful salesmen will tell you two important things about selling.

1. That the selling process is largely a matter of communicating ideas. 2. And that specialized business publication advertising can help importantly to register information with prospects.

Of course each salesman will express this in his own way ... but they all agree that selling would be far more difficult without the advertising that appears in the industrial, trade, and professional publications that serve the specialized markets to which they sell.

Here, for instance, is what a salesman has to say about this kind of advertising:

William W. Cox  
AMP, Incorporated  
sells to industry



### Says Mr. Cox:

"The quickest way we can introduce a product is by introducing it through advertising in business papers. That way we get it around faster than we can by word of mouth alone. On occasion my home office has inquiries out to me before I can get to the customer or prospect to introduce a new product. They've already seen it in a trade magazine.

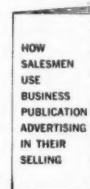
"It's interesting to note that within the last two weeks I received a survey which shows about 80% of the new customers we get on our books come through our trade publication advertising. Of course, our company is only 15 years old and we have grown from what you might say, *nothing*, to the biggest in our business. Certainly a lot of that has come from our advertising campaigns. Our name is known throughout the world right now, purely because of our advertising program. When I go to a prospect now, they know my company, they know my product... it makes

my job easier, and opens doors when I have to make cold calls."

**Ask your own salesmen** what your company's business publication advertising does for them. If their answers are generally favorable you can be sure that your business publication advertising is really helping them sell. If too many answers are negative it could well pay you to review your advertising objectives—and to make sure the publications that carry your advertising are read by the men who must be sold.

### How salesmen use their companies' advertising to get more business

Here's a useful and effective package of ideas for the sales manager, advertising manager or agency man who would like to get more horsepower out of his advertising. Send for a free copy of the pocket size booklet entitled, "How Salesmen Use Advertising in Their Selling," which reports the successful methods employed by eleven salesmen who tell how they get more value out of their companies' advertising.



You'll find represented many interesting variations in how they do this. Some are very ingenious; all are effective. You can be sure that more of your salesmen will use your advertising after they read how others get business through these simple methods.

The coupon is for your convenience in sending for your free copy. Then, if you decide you want to provide your salesmen with additional copies, they are available from NBP Headquarters in Washington, at twenty-five cents each. Or if you choose you can reprint the material yourself and distribute it as widely as you please. But first, send for your free copy.

NATIONAL BUSINESS PUBLICATIONS, INC.  
Department 4D  
1413 K Street, N. W.  
Washington 5, D. C.      STerling 3-7533

Please send me a free copy of the NBP booklet "How Salesmen Use Advertising in Their Selling."

Name \_\_\_\_\_  
Title \_\_\_\_\_  
Company \_\_\_\_\_  
Street Address \_\_\_\_\_  
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

### National Business Publications, Inc.



... each of which serves a specialized market in a specific industry, trade or profession.

# PROPELLAIR

...built to solve  
your "heavy duty"  
ventilating problems



...mount in any position

Heavy duty Propellair Type "CD" fans are designed for versatility and rugged duty. They can be mounted in side walls, roof ventilators, hoods, ducts and machinery in any position you require. They are ideal for "tough" ventilating jobs like removing heat, moisture, smoke and dust laden air. You get greater efficiency and quieter operation, because the exclusive venturi entrance ring prevents wasteful recirculation. The rigid, cast aluminum, precision balanced air-foil propeller runs quieter and retains its clean aerodynamic characteristics at all operating pressures. Powered by dependable Robbins & Myers Motors of any design you need, they are covered by a single name-plate guarantee. Available in sizes from 12" to 60" for from 1020 to 85000 CFM air delivery. Let Propellair engineers survey your needs and recommend the correct ventilating equipment.

WRITE FOR BULLETIN NO. 690-C



**PROPELLAIR®**

DIV. OF ROBBINS AND MYERS, INC.  
SPRINGFIELD, OHIO

Certified  
Ratings



MOVING AIR IS OUR BUSINESS

Check 2227 opposite last page.

## ENGINEERING

### Flexible ceramic fiber protects in two ways

Insulates and sounds  
alarm in event of leak

Uses: For positive high-temperature insulation.

Features: Material both insulates and causes alarm-sounding short-circuit in event of leak.

Description: Ceramic fiber insulating fabric is available in various widths or thickness. It is also supplied as instrumentation tape. Fabric is designed to withstand 1500°F for 1500 hours, and is flexible enough to be wrapped in spiral form around pipe as small as 1/2" diameter. High temperature fabric can be treated with silicone rubbers, epoxy resins, or can be impregnated with phenolic resin and molded into various shapes. Fabric can also be woven into tubular form.

(Insulating fabric is product of The Russell Mfg. Co., Dept. CP, Middletown, Conn.)

Check 2228 opposite last page.

### Steel tank picture story

Attractive 36-page brochure contains pictorial presentation of company's equipment, facilities, and production operation for making steel tanks. CST Brochure—Chicago Steel Tank Co., Div., of U. S. Industries, Inc., 6400 W. 66th St., Chicago 38, Ill.

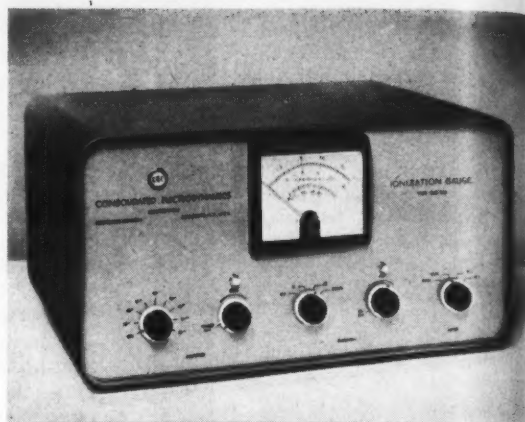
Check 2229 opposite last page.

### Valve seat is protected from particles, shock, by composition disc

Replaced without removing  
valve body from line

Uses: For service on liquid lines where full unobstructed flow or minimum resistance to flow is desired.

Features: Renewable composition disc protects valve seat from damage due to solid particles and from shocks of pulsating pressures. Disc can be replaced without removing



## A new low in high vacuum gauging 2 x 10<sup>-12</sup> mm Hg

Now you can read a vacuum system continuously through the entire range of 1 x 10<sup>-3</sup> to 2 x 10<sup>-12</sup> mm Hg on eight decades.

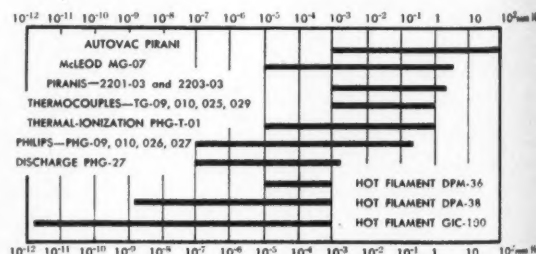
A new emission control circuit on the CEC GIC-100 gauge makes it possible to cover this broad range with amazing accuracy. With this new control you can vary emission from 25 microamperes to 20 milliamperes over three separate ranges.

Thus you get a greatly reduced emission current which in turn makes for longer tube life, less ion pumping, and minimum X-ray effects at ultra low pressures.

Since you can degas either by resistance or by electron bombardment, it's possible to use any standard ionization tube with this gauge.

The accessories available include a 2-station thermocouple circuit to read from 1 to 1000 microns. There are provisions for a recorder to read both the thermocouple stations and the ionization tube output.

For more information on the GIC-100 and the complete line of 17 CEC high-vacuum gauges charted below, write for Brochure 9-1. This new 24-page brochure is the first of its kind in the high-vacuum field.



**Consolidated ElectroDynamics**

Rochester Division, Rochester 3, N.Y.

formerly Consolidated Vacuum

SALES AND SERVICE OFFICES IN PRINCIPAL CITIES

Check 2230 opposite last page.

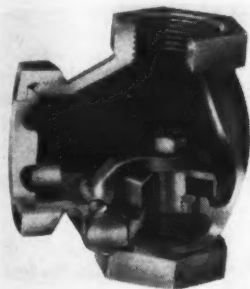
CHEMICAL PROCESSING



## ENGINEERING

valve body from line.

**Description:** Bronze swing check valve is rated at 150 lb steam working pressure, 300 lb cold water, oil, or gas pres-



Easily replaceable, renewable composition disc protects valve seat from damage

sure — non-shock. Valve is available in 1/2-2" sizes.

(Bronze swing check valve is product of The Fairbanks Company, 393 Lafayette St., New York 3, N.Y.)

Check 2231 opposite last page.

### Extremes in temperatures have no adverse effect on versatile lubricant

**Uses:** For all plumbing and heating requirements as well as conventional grease-lubricated bearings, and other machine elements.

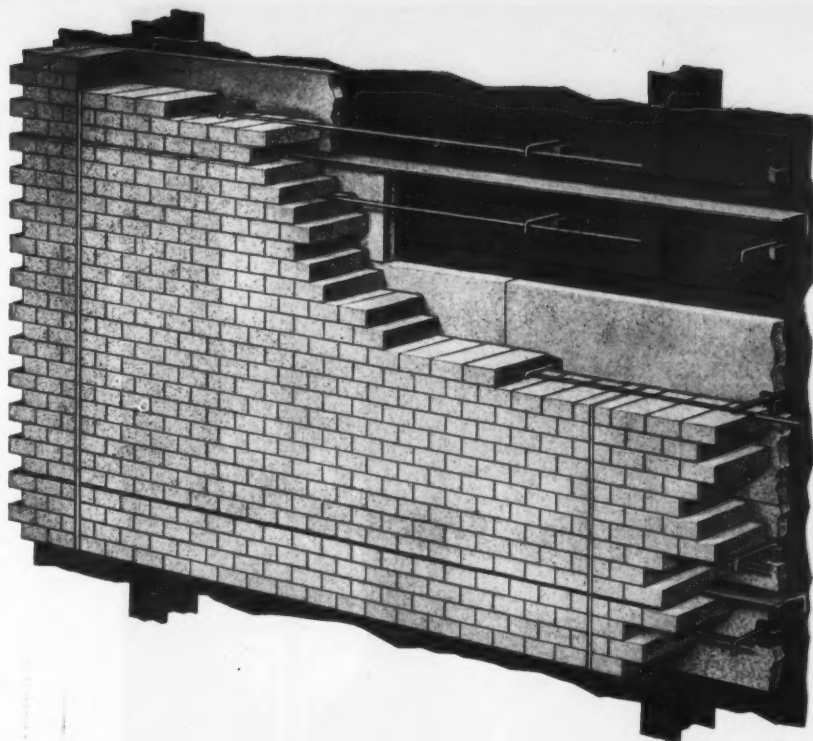
**Features:** Normal texture, structure, and consistency of lubricant are retained even when it is subjected to extremes of either heat or severe cold. It has outstanding resistance to oxidation. Lubricant has been used on glass-annealing conveyor bearings at temperatures above 500°F.

**Description:** Multi-purpose lubricant can be easily applied by any conventional method — hand, grease-cup, pressure-gun, or centralized lubrication system. It is said to be exceptionally resistant to water and to protect against rust and corrosion to a degree not found in other lubes.

(Faucet & Valve Stem Lubricant is product of J. A. Sexauer Mfg. Co., 2503 Third Ave., New York 51, N.Y.)

Check 2232 opposite last page.

B&W Insulating Firebrick sectionally supported wall construction, horizontal rod-type anchoring



## Can this construction cut your costs?

Simplified design and lower material costs in initial construction, ease of installation and maintenance, reduced downtime and economy of operation—these are the benefits of this lightweight insulating firebrick construction.

Here's what lightweight means. Compared with dense fireclay refractory materials that weigh from 125 to 140 lb per cu ft, lightweight insulating firebrick weigh approximately 26 lb per cu ft for B&W's 2000 degree brick. This difference provides two major advantages: (1) mechanical, which largely affects design and construction, and (2) thermal, which saves in maintenance, downtime and operation.

### Savings in design and construction

The use of lightweight IFB simplifies engineering requirements and reduces costs. A minimum of detailing is needed, since the design is engineered around one standard shape—a feature of B&W IFB constructions.

Material requirements are simplified, too. B&W IFB can be tailor-cut, drilled or shaped as necessary, eliminating the need for costly special fired shapes, and the delays in obtaining them. Typical sections, such as burner openings, observation ports and tube supports, can be cut and shaped on the job in minutes, using ordinary woodworking tools.

Substantial savings are possible in structural steel, since insulating firebrick roof and wall constructions are lighter. In locations with soil of poor load bearing capacities, this lightweight may also result in reduced foundation costs.

These savings, coupled with B&W's engineering and service facilities available during the design phase, mean lower initial costs.

### Savings in maintenance, downtime and operation

Lightweight IFB offer a major thermal benefit—they store and conduct less heat. Heavy refractories retain heat; in the event of forced shutdown, they can cause burn-out of expensive alloy tubes, where used. The low quantity of heat stored by B&W IFB can be quickly dissipated, thus protecting these expensive tubes.

Further, this low heat storage permits faster heating and cooling. This means quicker access to the furnace in the event of emergency shutdown. Your maintenance crew can get in the furnace sooner and get it back on stream faster.

### Supplied from nearby warehouses

With the use of simplified IFB constructions, refractory repairs can be quickly and easily accomplished with

standard shapes from a nearby warehouse. This eliminates costly delays in obtaining special shapes.

Anchoring devices, too, are simplified. Since there are no expensive special castings in B&W IFB constructions, carbon steel or low alloy rods can be used. These are generally available from any local steel warehouse.

### Increased efficiency

Generally, the lighter a firebrick the better an insulator it is. Since B&W IFB are the lightest insulating firebrick made, they are the most efficient insulators. Per inch of thickness, B&W IFB provide more insulation than any other refractory material. The result is that for walls of equivalent thickness less heat is lost with B&W IFB. Casing temperatures are lower, thus improving working conditions. This means increased efficiency and reduced operating costs.

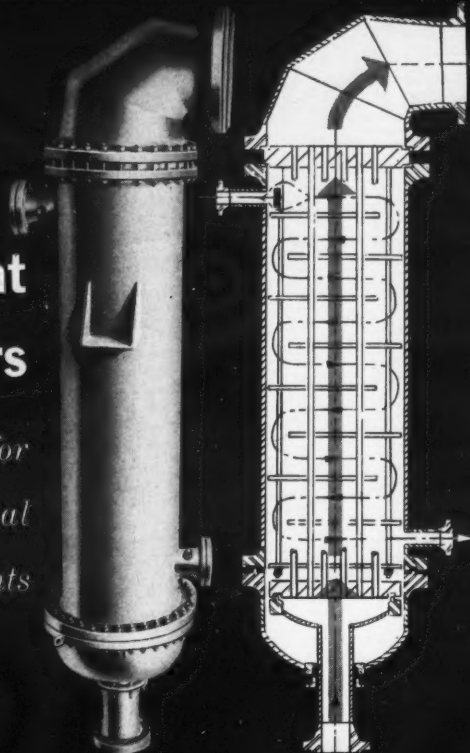


Check 2233 opposite last page.



## Heat Exchangers

*designed for  
individual  
requirements*



*Vertical thermosyphon type reboiler.*

**Forty years experience** designing and fabricating equipment to withstand extreme conditions of temperature, pressure and corrosion ... fine facilities ... personal follow-through to meet customers' exact requirements ... all combine to make SWECO the dependable source for heat exchangers.

SWECO Heat Exchangers are manufactured from SWECO designs developed to meet the needs of individual clients, or from designs provided by the client. There are several standard types, all of which can be adapted to meet special requirements. Depending on the needs of the installation, they can be fabricated from any of a wide range of materials, including stainless steels, quality carbon steel plate, low alloys, Monel, Inconel, aluminum, copper and brass. Proper allowance for fouling factors assures dependable long-term operation without costly down-time for cleaning and repairs.

As an additional service, SWECO has facilities for rebuilding, replacing and repairing all types of tubular heat exchange equipment. Materials for replacement components held in open stock provide extra-fast service during shut-down periods.

For detailed descriptions and illustrations of SWECO Heat Exchangers, and Pressure Vessels, write for bulletin M-8-3.

*See SWECO equipment at the 26th Exposition of Chemical Industries, New York Coliseum, December 2-6, Booth 1250.*



**Southwestern Engineering Company**  
4800 Santa Fe Avenue, Los Angeles 58, California  
LUdlow 3-6262—Cable: SWECOLA  
*Engineers and Constructors ... Manufacturers*

Check 2234 opposite last page.



## new literature

Industrial bulletins pertinent to the reader ... offering data on products, processes, services. Additional reviews of catalogs, bulletins, data sheets, etc., are found throughout other sections of this magazine

### Packaging cost saving

Brochure of 12 pages cites case histories in various fields where manufacturer's fiber board has been used for cost saving protective packaging to effectively brace, block, and cushion a variety of products. "Cost Saving Packaging" — The Celotex Corp., 120 S. LaSalle St., Chicago, Ill.

Check 2235 opposite last page.

### Multi-level conveyors

Informative bulletin of eight pages features manufacturer's multiple-level conveyor systems. Presenting many examples of material handling automation, bulletin also contains drawings, plans, flow patterns, and photos. Bul E-557—West Bend Equipment Corp., Dept. CP, 365 Water St., West Bend, Wis.

Check 2236 opposite last page.

### Packed static beds

Bulletin of four pages discusses pressure drop through packed static beds. Various granular adsorbents are described and basic design equations for calculating pressure drop are cited. Tech Info 1021—Minerals & Chemicals Corp. of America, Essex Turnpike, Menlo Park, N.J.

Check 2237 opposite last page.

### Dry 'fluid' drive

Bulletin of six pages explains operating principles and advantages of manufacturer's dry "fluid" drive using heat-treated steel shot. Other products including clutches and couplings are described and illustrated. Four-page bulletin describes larger size drive and couplings and lists various

motor sizes with which drive may be used. Buls A-646A and A654—Dodge Mfg. Corp., Mishawaka, Ind.

Check 2238 opposite last page.

### Improvements in motors

Bulletin presents complete story on improvements of explosion-proof and corrosion-resistant motors to meet latest demands of chemical service. Bul 800 — Louis Allis Company, 448 East Stewart St., Milwaukee 1, Wis.

Check 2219 opposite last page.

### Granular material dryers

Rotary steam dryer for accurately adjusting moisture content of granular chemicals, minerals, etc., is fully described in four-page bulletin. Operation and specifications are covered, and features pointed out. Bul 457 — The V.D. Anderson Company, Div. of International Basic Economy Corp., 1935 W. 96th St., Cleveland 2, Ohio.

Check 2240 opposite last page.

### Uncle's answer book

The 1957 edition of the statistical abstract of the US is now available. New information on important subjects such as atomic energy activities is provided. This easy-to-use reference volume is a fountain of information on almost any subject including business, banking, industry, transportation, communications, population and other vital statistics, and is an invaluable aid to serious users and quiz fanatics alike. The abstract contains 1061 pages, 1185 tables and 40 charts. To obtain 1957

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ROCESSING

## For profitable processing



**MULTI-WASH**  
Collectors  
are the  
answer

Schneible Multi-Wash Collectors are a profitable investment in efficient processing, while improving your community relations.

In the industry, Multi-Wash Collectors are now performing essential production duties in cooling gases and condensing vapors. In addition, applications to profitable by-product recovery are commonplace.

Get new production efficiency with Multi-Wash. Write or wire for detailed information that applies to your problem.

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**CLAUDE B. SCHNEIBLE COMPANY**  
P.O. Box 296 Roosevelt Pk. Annex  
Detroit 32, Michigan • TAshmo 5-7772

Check 2241 opposite last page.

NOVEMBER 1957

edition of the Statistical Abstract of the United States, remit \$3.50 direct to the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. It may also be purchased at any of the Field Service Offices of the United States Department of Commerce in larger cities.

### Automatic control system

Manufacturer's colorful eight-page bulletin illustrates and describes automatic control system for a variety of duties such as constant pressure, proportional flow, constant liquid level, proportional conveyor control, etc. Brightly illustrated examples of ways in which equipment is used are presented. Form F-882—U.S. Electrical Motors, Inc., Box 2058 Terminal Annex, Los Angeles 54, Calif.

Check 2242 opposite last page.

### Gas Analyzers

Manufacturer's 22-page literature package covers important areas of instrument applications in spectrophotometry and gas chromatography. Analysis of aerosol-type propellants by gas chromatography, and how automatic recording spectrophotometer aids reagent production are included in separate reports featured. Package 4-1—Scientific Instruments Div., Beckman Instruments, Inc., 2500 Fullerton Rd., Fullerton, Calif.

Check 2244 opposite last page.

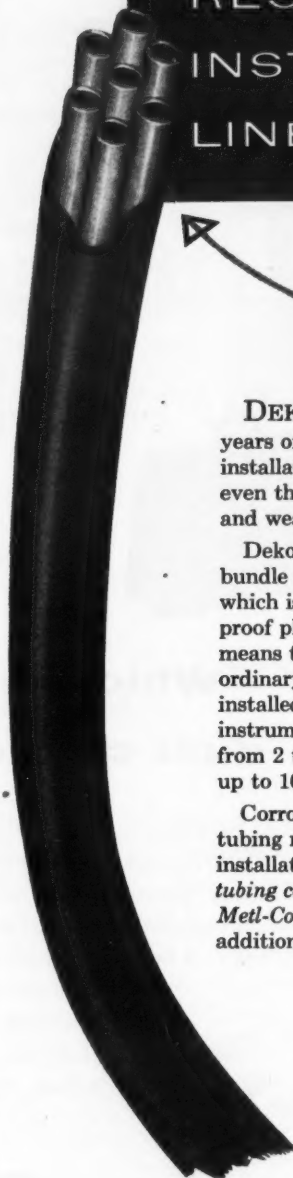
### Dryers, kilns, coolers

Manufacturer's bulletin provides data on heat-transfer equipment such as ribbon-flight dryer, rotary kiln, air-quenching cooler, and rotary dryer. Suggestions on how to cut heat-transfer costs are incorporated. Bul 25C6177 — Industrial Equipment Div., Allis-Chalmers Mfg. Co., Milwaukee 1, Wisconsin.

Check 1805 opposite last page.

## DEKORON PRODUCTS CUT INSTRUMENT TUBING COSTS

**CORROSION  
RESISTANT METAL  
INSTRUMENT  
LINE HARNESS**



Dekoron Metl-Cor®, tried and proven in years of service in literally thousands of installations, is impervious to attack from even the most corrosive industrial atmospheres and weather conditions.

Dekoron Metl-Cor is a multiple tube bundle of copper or aluminum tubes over which is extruded a thick sheath of corrosion-proof plastic. This harnessed construction means that it costs much less to install than ordinary metal tubing because many tubes are installed at one handling. Metl-Cor instrument line harness is available with from 2 to 19 (7 illustrated) tubes per bundle, up to 1000 ft. in length.

Corrosion resistance . . . elimination of tubing replacements . . . ease and speed of installation—no other metal instrument tubing can compare with patented Dekoron Metl-Cor. Request Bulletin 456 for additional information.

**Dekoron® products**

quality  
research  
service

**SAMUEL MOORE & COMPANY • MANTUA, OHIO**  
DEKORON PRODUCTS DIVISION

Check 2245 opposite last page.



**A** Buell Cyclones offer exclusive Shave-off which harnesses double-eddy currents and puts them to work, large diameter design which eliminates bridging and clogging.

**B** Buell "SF" Electric Precipitator delivers extra collection efficiency through use of unique high emission, selftensioning Spiralectrodes and exclusive Continuous Cycle Rapping.

**C** Buell Combination Cyclone-Precipitator Systems combine exclusive Buell features for extra efficiency where extremely high performance standards must be met.

## Which is the best dust collection system?

Five factors influence the choice of a dust collection system: dust characteristics, gas characteristics, efficiency required, installation and operation costs, and limitations of space or draft loss. In every installation, exclusive Buell features provide *extra efficiency*. A booklet, "The Collection and Recovery of

Industrial Dusts", provides valuable, specific details. Just write Dept. 11-K, Buell Engineering Company, Inc., 123 William Street, N.Y. 38, N.Y.



# buell

Experts at delivering Extra Efficiency in **DUST COLLECTION SYSTEMS**

Check 2246 opposite last page.

## NEW LITERATURE

### For feeding dry material

Construction of feeder designed to feed any dry material dependably and accurately over a 40-to-1 adjustable feed rate is described in eight-page bulletin. Capacity and dimensional data are included. Bul 20-P2—Omega Machine Company, Dept. CP, 345 Harris Ave., Providence 1, R.I. Check 2247 opposite last page.

### Details rotary pump

Pertinent data on rotary pump designed for broad range of clean-liquid applications are presented. Units are all-iron or all-iron with bronze bearings. Rotary Pump cat — Geo. D. Roper Corporation, 741 Blackhawk Park Ave., Rockford, Ill.

Check 1755 opposite last page.

### Wet screening unit

Design, operation, and advantages of wet screening unit for non-fibrous slurry feeds are described in four-page bulletin. Cutaway drawings of unit show construction. Bul 2300—Dorr-Oliver Inc., Barry Place, Stamford, Conn.

Check 2248 opposite last page.

### Loud, clear, safe

Six-page pocket-size folder briefly describes gas-operated audible signal equipment "Sounds for Safety" — Falcon Alarm Co., Inc., 243 Broad St., Summit, New Jersey.

Check 2249 opposite last page.

### Redesigned filters

Specifications, dimension drawings, cross-section views, and typical systems of manufacturer's redesigned carbon and stainless steel small filters are provided in two-page bulletin. Bul 615—R. P. Adams Co., Inc., 343 Park Drive, Buffalo 17, N.Y.

Check 2250 opposite last page.

### Exhausts

Catalog of fan for chemical or flammable industrial dust — Deere of America, Inc., East Moline, Ill. Check 206

### Rotary b

Detailed company's er product as little as is contained in bulletin. Specifications included. Buell's Mill and Clay, Massachusetts. Check 225

### Spray dr

Manufacture for pilot and illustration in bulletin. Detailed specifications included. Buell's Schwartz, Tabor, Pennsylvania. Check 225

### Heat ex

Booklet on rapid analysis costs between finned coils and tube heat exchangers. Comparative Costs Booklet, Tube, Diaphragm, Hecla, Inc., Detroit 26, Mich. Check 225

### Laborator

Details of laboratory equipment in six-page bulletin. 1-Spinco Instruments, Inc., California Ave., Berkeley, Calif. Check 225



## Dry material

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## NEW LITERATURE

### Exhausts oven vapors

Catalog contains full data on fan for exhausting explosive or flammable vapors from industrial ovens. Bifurcator Fan cat — De Bothezat Fans, Div. of American Machine and Metals, Inc., Dept. CPD-1157, East Moline, Ill.

Check 2062 opposite last page.

### Rotary batch blender

Detailed description of how company's rotary batch blender produces intimate blends in as little as one to two minutes is contained in four-page bulletin. Specifications and illustrations of equipment are included. Bul BL-157 — Sturtevant Mill Co., Dept. CP, Park and Clayton Sts., Boston 22, Massachusetts.

Check 2251 opposite last page.

### Spray dryer data

Manufacturer's spray dryer for pilot plant is described and illustrated in eight-page bulletin. Dimensions and general specifications are included. Bul 431—Proctor & Schwartz, Inc., 7th St., and Tabor Rd., Philadelphia 20, Pennsylvania.

Check 2252 opposite last page.

### Heat exchanger costs

Booklet of 20 pages provides rapid analysis of comparable costs between plain and low-finned condenser tube shell and tube heat exchangers over range of common applications. Comparative Heat Exchanger Costs Booklet — Wolverine Tube, Div. of Calumet & Hecla, Inc., Guardian Bldg., Detroit 26, Michigan.

Check 2253 opposite last page.

### Laboratory centrifuge

Details of 51,000-times-gravity lab centrifuge are supplied in six-page bulletin. Bul SBK-1-Spinco Div., Beckman Instruments, Inc., 1087 California Ave., Palo Alto, Calif.

Check 2254 opposite last page.

# GRIPHOIST TIRFOR Saves Man-hours for you on Maintenance and Installation... Safety Approved



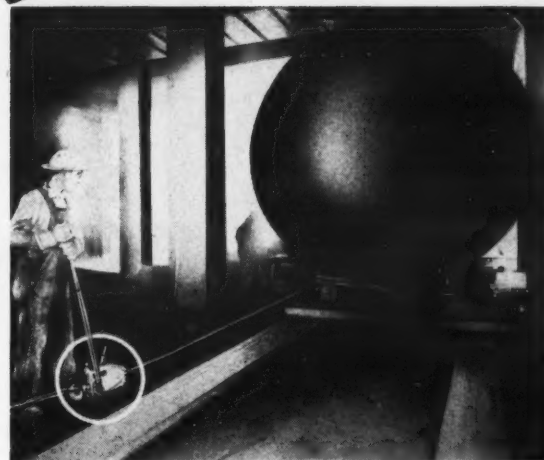
One man often does the work of a crew of 4 to 6 men

1. Repairing heavy equipment in field.
2. Removing heat exchanger tube nests.
3. Removing baffles in catalyst towers.
4. Installing and repairing heavy pumps.
5. Hoisting and pulling heavy loads where power machinery is not available.
6. Loading and unloading trucks.

Ask your dealer or write

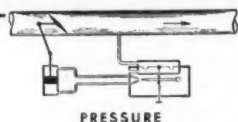
**Princeton GripHoist, Inc.** 32 GEORGE STREET  
BOSTON 19, MASS.  
**GripHoist, Inc.** 424 BRYANT STREET  
SAN FRANCISCO 7, CALIF.

Check 2255 opposite last page.

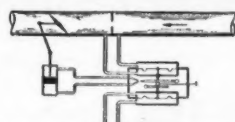


One man using a GRIPHOIST places heavy tank in 5 minutes. Manually-operated; portable; light weight 42 lbs.; unlimited travel 1/2" wire rope; rated 3300 lbs. single line to 6 tons 4-part line.

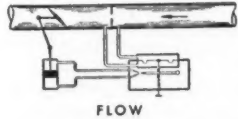
## For Pressure, Flow or Proportion Control THE ASKANIA JET PIPE REGULATOR



PRESSURE



PROPORTION



FLOW

...the simplest, accurate, long life solution to automatic control problems.

What are the IDEAL requirements for a regulator controlling pressure—flow—blending and other variables?

### Do they include:

- 1•Power to operate the heaviest valves even under sticking conditions
- 2•Unimpeded Operation in Freezing Weather
- 3•Low Maintenance
- 4•Rugged Construction
- 5•Dependability
- 6•Long Life
- 7•Accuracy
- 8•Speed

All these features are typical of all ASKANIA Jet-Pipe Regulators.

For further information on the type of regulator best suited for your problem, send today for Bulletin No. 139 and 155. Write the ASKANIA REGULATOR COMPANY, 242 East Ontario St., Chicago, Illinois

**ASKANIA REGULATOR COMPANY**  
"CONTROLS FOR INDUSTRY"  
HYDRAULIC, ELECTRONIC CONTROLS & SERVOS, GENERAL SYSTEMS,  
ENGINEERING & COMPUTER SERVICE, VALVE ACTUATORS & CYLINDERS

A SUBSIDIARY OF



Check 2256 opposite last page.

## NEW POCKET CALCULATOR For Liquid Batch Mixing

**CAPACI-DIAL for  
PNEUMIX**

**AGITATORS**

Simply turn the pointer to the particular volume and consistency of your batch. The selector automatically tells the best size Pneumix Agitator to do your mixing.



The attached  
coupon will  
get you one  
without  
obligation.

**ECLIPSE AIR BRUSH CO.**  
308 Park Ave. Newark 7, N.J.

Please send free CAPACI-DIAL to:

Name .....

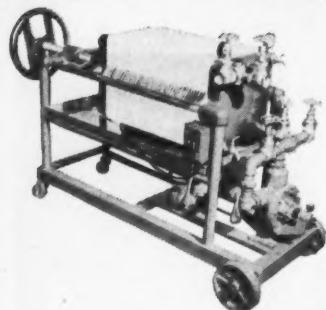
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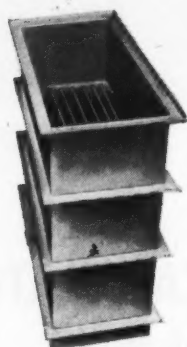
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# Investigate THESE 4 UNIQUE HERCULES FILTERS

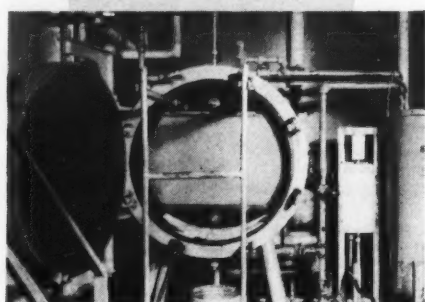
AT THE EXPOSITION  
... AND AFTER ...



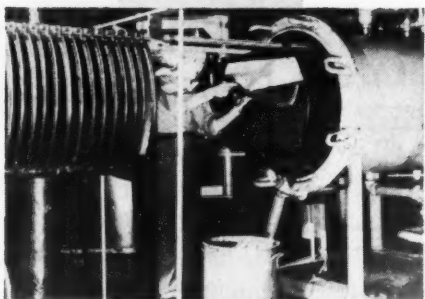
SHEET FILTER



SUCTION LEAF FILTER



SEE THE ROTA-JET IN ACTUAL OPERATION



RAPIDOR WITH OVERHEAD RACK & AUTOMATIC PULL OUT

Write today for information on the filter that best serves your needs.

## FREE HANDBOOK

If you have anything to filter, you need this 16 page handbook. It illustrates and gives the complete story of the Principles of Pressure Leaf Filtration, the Construction of Filters, Filter Operation and Important Features to look for when purchasing Filters.

Hercules Filter Corporation  
213 Ethyl Avenue  
Hawthorne, N. J.

Dear Sir:

Will you kindly send me free of charge, the 16 page illustrated folder, "Liquid Filtration through Hercules Pressure Leaf Filter."

Name .....

Company .....

Address .....

City ..... State .....

# HERCULES FILTER CORP.

213 Ethyl Avenue

Hawthorne, N. J.

Check 2258 opposite last page.

## NEW LITERATURE

### Compacting process

Information on manufacturer's compacting process and description of equipment including compacting mill, roller mill, and gyratory screen are contained in bulletin. Operation of system is explained and advantages pointed out. Bul 25C6177J—Industrial Equipment Div., Allis-Chalmers Mfg. Co., Milwaukee 1, Wisconsin.

Check 2259 opposite last page.

### Centrifuge applications

Manufacturer's booklet provides detailed information on how to apply centrifugal equipment to processes like separation, extraction, dehydration, and clarification. "Centrifugal Force"—American Tool & Machine Company, 1423 Hyde Park Ave., Boston 36, Massachusetts.

Check 2117 opposite last page.

### Overhead electric cranes

Bulletin of 28 pages helps you to quickly determine which overhead electric crane will best meet your specific requirements. Structural and mechanical details, dimensions, and specifications are included. Bul 150-05-1-57—Shaw-Box Crane & Hoist Div., Manning, Maxwell & Moore, Inc., Muskegon, Mich.

Check 2260 opposite last page.

### Data processing system

Bulletin of eight pages describes practical data system for process industries. Economics of automatic data processing in present day well-instrumented plant are outlined. Application of systems to present day process plant control and provision for future expansion is described. Bul 3010—Systems Div., Beckman Instruments, Inc., 325 Muller Ave., Anaheim, California.

Check 2261 opposite last page.

make spot repairs  
without shutdown



use the  
**Plastic Steel®**

A DEVCON PRODUCT 80% Steel — 20% Plastic

## EMERGENCY REPAIR KIT

Repair storage tanks . . . truck tanks . . . piping  
. . . pumps . . . valves!

Proven in use throughout industry — used on ocean-going tankers, large (80,000 barrel) bulk storage tanks. PLASTIC STEEL makes quick, easy repairs, eliminates shutdown — saves time and money. As easy to use as modeling clay. Even pipes under pressure can be repaired!

Now — you can make on-the-spot repairs . . . stop leaks in tanks or piping . . . repair broken metal parts and castings . . . rebuild worn valves or pumps . . . mend cracks in boiler jackets and radiators. PLASTIC STEEL hardens in 2 hours to a tough steel-like mass that is unaffected by fuel oil, gasoline, and most chemicals. Will not rust or corrode — can be painted.

PLASTIC  
STEEL

bonds  
iron,  
steel,  
brass,  
bronze,  
aluminum,  
glass,  
wood,  
concrete,  
etc., to  
itself or  
each other.

## EMERGENCY REPAIR KIT \$3.25

Contains 1 pound PLASTIC STEEL, hardening agent, release agent, Neoprene-steel patch, specially treated glass tape, measuring spoons, pictures and complete instructions.



Order from your industrial or plumbing supplier  
Write for free booklet describing the 1001 uses for  
PLASTIC STEEL.

**DEVCON CORPORATION**

135 Endicott Street, Danvers, Mass.

Check 2262 opposite last page.

CHEMICAL PROCESSING



### Closed-circuit TV camera

Catalog of four pages on self-contained closed-circuit TV camera lists outstanding features and describes design characteristics, built-in power supply, and control accessories for complete remote operation. Details, specifications, and dimensions are also provided. Model PD-500 cat—General Precision Laboratory, Inc., subs. of General Precision Equipment Corp., 63 Bedford Rd., Pleasantville, N.Y.

Check 2263 opposite last page.

### Safety clothing

Bulletin of four pages describes line of aluminized, asbestos, safety clothing. Keyed chart of laboratory controlled test results indicates high heat-resisting efficiency of clothing in comparison with conventional protective materials. Bul 1301-7 — Mine Safety Appliances Co., 201 N. Braddock Ave., Pittsburgh 8, Pennsylvania.

Check 2264 opposite last page.

### Calcium carbonates

Six and 16-page summaries discuss precipitated calcium carbonate as an extender in formulating "dead flat" wall paints, and as inert filler for compounding PVC plastic products. Calcium Carbonate Buls — Silicate, Detergent, Calcium Div., Diamond Alkali Co., 300 Union Commerce Bldg., Cleveland 14, Ohio.

Check 2265 opposite last page.

### Solves mixing problem

Selector automatically tells correct manufacturer's air-motored agitator for each liquid batch mixing problem. Description of outstanding features of equipment is contained on reverse side of handy pocket-size dial. Agitator Selector — Eclipse Air Brush Co., 390 Park Ave., Newark 7, New Jersey.

Check 2266 opposite last page.



An Anders compressed air dryer fully automatic differential pressure explosion-proof type with steam regeneration and external heater and cooler, with an oil adsorbing prefilter. Anders, a new division of Milton Roy Company, has had over 20 years of experience in building quality instrument air dryers and gas dehydrators.

## Keep your pneumatic controls operating efficiently ... WITH ANDERS AIR DRYERS

You can be sure that your pneumatic control instruments will operate at highest efficiency when your air supply is clean and dry. Proper conditioning of your air supply is assured by Anders Instrument Air Dryers . . . continuous units in which the adsorption, reactivation and cooling cycles are entirely automatic, requiring no attention. Semi-automatic and manually regenerated models are also available.

These automatic dryers are:

- built with open, weatherproof or explosion-proof features
- available in 24 standard sizes for quick delivery • designed for 3 hour regeneration cycles and up • supplied for steam

or electric activation • welded construction according to ASME and ASA Codes

Anders air dryers range in size from a 5 SCFM to an 11,500 SCFM unit. Specially engineered dehydrators for various gases and liquid hydrocarbons are also available . . . in sizes to 100,000 SCFM, at pressures up to 6,000 psi.

For additional information, write for Bulletin 857— "Anders Instrument Air Dryers."

Anders Lykens Corp., a division of MILTON ROY COMPANY, 1300 East Mermaid Lane, Philadelphia 18, Pa., Engineering Representatives throughout the world.

VISIT OUR BOOTH No. 610  
26th Exposition  
of Chemical Industries  
The COLISEUM, N.Y.C. • DEC. 2-6, 1957



CONTROLLED VOLUME PUMPS • QUANTICHEM ANALYZERS  
CHEMICAL FEED SYSTEMS • ANDERS AIR AND GAS DRYERS

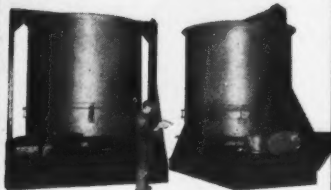
Check 2267 opposite last page.



## PULVA

PRODUCTS YOU  
SHOULD KNOW  
ABOUT

### THE Com-Bin Feeder



A combination Surge Bin and Feeder for continuous feeding of dry, damp, wet, sticky, difficult to feed materials which give trouble when placed in a conventional bin or hopper. Produces a positive, uniform, metered feed from pounds per minute to 100 tons per hours or more.

WRITE FOR DESCRIPTIVE  
CATALOG No. 5607

### THE PULVA-SIZER

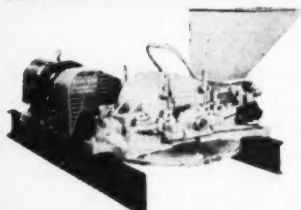
A SIZE AND TYPE TO MEET  
YOUR REQUIREMENTS

FINE GRINDING

DISPERSING

BLENDING

CLOSE PARTICLE CONTROL



The PULVA-SIZER is the ultimate in high-speed hammer mill design. It is a complete grinding unit for dustless, trouble-free, continuous, controlled grinding.

WRITE FOR DESCRIPTIVE  
CATALOG No. 5510

VISIT "OUR BOOTH No. 220"  
AT THE  
CHEMICAL SHOW — DECEMBER 2-6

## PULVA

Corporation

555 High Street, Perth Amboy, N. J.  
VA 6-3450

Check 2268 opposite last page.

## NEW LITERATURE

### Iron, steel oxidation

Bulletin of four pages describes process for increasing oxidation resistance of iron and steel. Case histories, performance test results, information on heat treatment, dimensional control, surface finish, advantages over coatings and platings, and photos of treated and untreated parts are included. Bul 1 — Chrom-alloy Corp., 450 Tarrytown Rd., White Plains, N. Y.

Check 2269 opposite last page.

### Handy lubricators

Here's information about handy, mobile power gun for saving time on plant lubrication jobs. Catalog also shows other lubrication equipment in manufacturer's line. Lubrication equipment cat — Alomite Div. of Stewart-Warner Corp., Dept. K-117, 1850 Diversey Parkway, Chicago 14, Illinois.

Check 1923 opposite last page.

### Seals, stuffing boxes

Bulletin of eight pages stresses interchangeability of corrosion-resistant seals and stuffing boxes for manufacturer's series of reactors. Operation is described and advantages pointed out. Stuffing box lubrication assemblies are illustrated. Bul 938—The Pfaunder Co., 1043 W. Ave., Rochester, N. Y.

Check 2270 opposite last page.

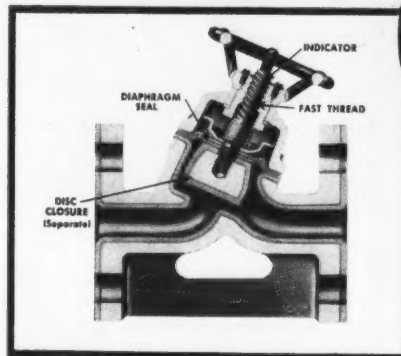
### Transparent rubber

Fifty page report on compounding transparent rubber discusses making of natural rubber compounds, and problems in developing transparent stocks with styrene-butadiene, nitrile, and neoprene rubbers. Hi-Sil Bul 15 — Columbia-Southern Chemical Corp., Sub. of Pittsburgh Plate Glass Co., One Gateway Center, Pittsburgh 22, Pa.

Check 2271 opposite last page.

## Best by Far - for Low Cost Corrosion, Abrasion, Vacuum and General Service

### W. S. ROCKWELL DIAPHRAGM VALVE



Always closes  
Diaphragm seals mechanism

Write for Bulletin



- No packing gland to leak. Mechanism not exposed.
- Oversized ports; high capacity; low pressure drop. Largest capacity of any diaphragm type valve.
- Self-draining in horizontal position.
- Closure is by rubber disc.
- Lower handwheel torque and fewer turns to close.
- Automatic control available.
- Body of any metal or with any lining.
- Sizes 1/2" to 6".

W. S. ROCKWELL COMPANY — 2207 Eliot St., Fairfield, Conn.

Check 2272 opposite last page.

## CRESCENT ARMORED MULTITUBE® Solves Your Corrosion Problems

### for INSTRUMENT TUBING

A corrosion proof sheath of Polyvinyl chloride over SPIRALLY CABLED copper or aluminum instrument tubing provides complete moisture and corrosion protection for the tubes. Flexible galvanized steel armor in various combinations, as shown, gives mechanical protection for permanence with handsome savings in installed cost.

Available in lengths to 1000 feet in from 2 to 37 tubes. Licensed under U. S. Patent #2,578,280. **SEND FOR BULLETIN 356-E**

Plastic Coated Single Tubes, copper or aluminum, should be used to give corrosion protection to all single lines up to the final tube fitting, where trouble from corrosion may occur.

## CRESCENT

INSULATED WIRE & CABLE CO.  
Trenton, N. J.

Check 2273 opposite last page.

CHEMICAL PROCESSING

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or with any

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UBE®  
ns

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corrosion  
corrosion

co.

ESSING

## NEW LITERATURE

### Describes mobile elevators

Complete specifications of manufacturer's foot-operated and battery-operated hydraulic elevators are contained in six-page bulletin. Equipment applications are illustrated. Bul 558 — Barrett-Cravens Co., 628 Dundee Road, Northbrook, Illinois.

Check 2274 opposite last page.

### Atomic energy literature

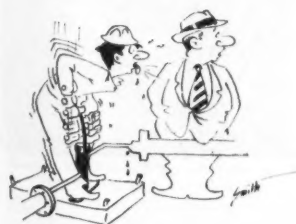
Bulletin of 74 pages describes technical information publications and services offered by the AEC, and tells how and where to obtain them. TIF 4575, "Guide to Atomic Energy Literature for the Civilian Application Program"—Technical Information Service Extension, US Atomic Energy Commission, PO Box 1001, Oak Ridge, Tenn.

Check 2275 opposite last page.

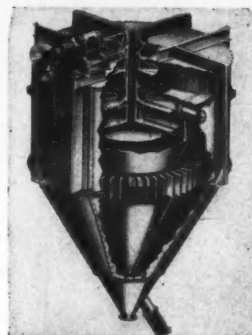
### frequency measurements

Many ways in which frequency meters can be used are in 17-page booklet. Such things as measurement of low to UHF frequencies, rotational velocity, flow, pressure, temperature, and strain are covered. Data File 111, Dept. 7211, Berkeley Div., Beckman Instruments, Inc., 2200 Wright Ave., Richmond 3, Calif.

Check 2276 opposite last page.

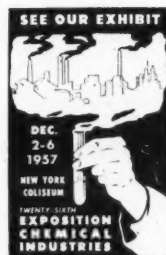


"Hang on a little longer John, that pump's just about repaired."



### MECHANICAL AIR SEPARATOR

with a double set of revolving Whizzer Blades. This is an exclusive Raymond feature for easy fineness control and close separation of the fines for uniformity of product.



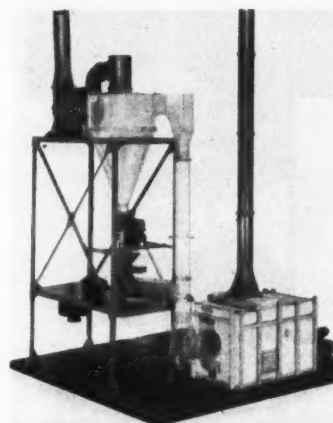
RAYMOND  
Booth #646



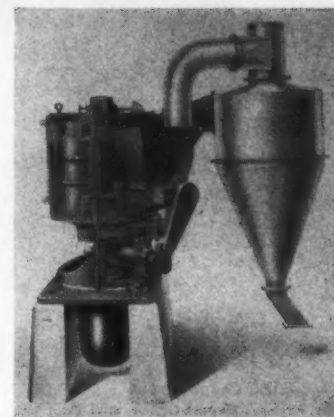
## RAYMOND EXHIBIT AT THE CHEMICAL SHOW

... will feature a plastic working model of a Flash Drying System to provide a clear view of the operation ... also a small Vertical Mill for extreme fine grinding ... and a Model of the Mechanical Air Separator with revolving Whizzers.

You are cordially invited to visit our Booth #646 to obtain information and descriptive bulletins of Raymond equipment in which you are interested.



No. 646



### VERTICAL MILL

For producing extremely fine finished materials in the sub-sieve sizes. It operates in the high fineness range beyond the limits of the conventional type mills.

### RAYMOND FLASH DRYING

For removing moisture with or without simultaneous pulverizing. An airstream system shown but Flash Drying can be applied to Cage Mills, Imp Mills, and Roller Mills also.

**COMBUSTION ENGINEERING, INC.**  
*Raymond Division*  
1317 North Branch St.  
Chicago 22, Illinois

COMBUSTION ENGINEERING-SUPERHEATER LTD., Montreal, Canada

Sales Offices in  
Principal Cities

Check 2277 opposite last page.

NOVEMBER 1957



# SAFE

## moisture and fume removal



Three outstanding features make Air-Van Power Exhausters especially suited for exhausting moisture and corrosive fumes.

- A patented scroll design assures positive air removal. Gallaher Air-Vans are designed to handle up to 65,000 CFM at static pressures to 4".
- The motor is out of the air stream.
- A patented air seal-off protects the motor by creating a constant curtain of fresh air around the motor shaft. This prevents any fumes from entering the motor housing.
- Other Air-Van features include quiet operation, low silhouette, weather-proof design, availability in special metals and finishes and certified ratings based on actual physical tests.

Patents 2188741 2526290  
Patents pending

## The GALLAHER Company

4108 Dodge Street Omaha, Nebraska  
Export Office: 306 Paul Bldg., Utica 2, N. Y. Cable "Kaiserquip"

Check 2278 opposite last page.

for more accurate chemical feed control at LOWER COST use a...

## "Packaged" NEPTUNE CHEMICAL FEED UNIT

JUST PIPE-IN . . .

PLUG-IN . . . AND OPERATE!

You'll get positive, accurate proportioning of chemicals when you use a NEPTUNE "packaged" chemical feed unit. That's because tank, agitator and pump are designed and built into one precisely-engineered chemical feed system. In addition to lower first cost and minimum upkeep, longer life is assured by 316 stainless steel piston, valves and ball checks.

- simply designed pump can be regulated easily to proportion exact quantities of chemical continuously
- agitator keeps precipitates from settling, assuring constant solution strength
- Y-type strainer removes harmful solids, prevents pump damage

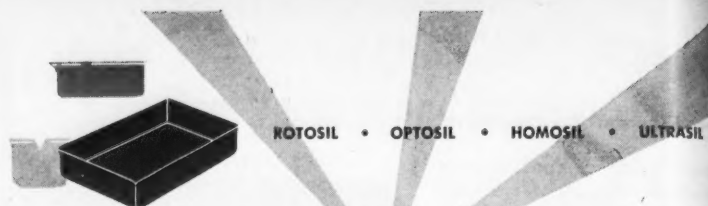
Write, wire or call for additional details and let us bid on your requirements.

**NEPTUNE PUMP MANUFACTURING CO.**  
chemical proportioning pumps and sump pumps

Tank, agitator and pump are combined in one smooth operating system that precisely proportions anything from treating chemicals, such as calgon, to petroleum distillates.

4912 NORTH 6TH STREET  
PHILADELPHIA 20, PA.  
phone: DAvenport 9-4983

Check 2279 opposite last page.



KOTOSIL • OPTOSIL • HOMOSIL • ULTRASIL

## CENTER FOR HIGH-PURITY FUSED QUARTZ



Amersil processes for producing fused quartz and silica of the highest possible purity, in fabricated laboratory and production equipment—make Amersil the primary supply source for all industrial applications where such critical purity is a factor.

A fine service plan is keyed to your requirements. Here, complete ranges of standard apparatus, crucibles, trays, cylindrical containers and tubing (up to 25" diam.) are available for prompt delivery. Amersil engineers are available to assist in developing special equipment to individual requirements. ★ ★ ★ ★

Catalog and technical data available upon request.

**AMERSIL COMPANY, INC.** FUSED SILICA AND QUARTZ

685 RAMSEY AVE., HILLSIDE 5, NEW JERSEY

ENGELHARD INDUSTRIES

Check 2280 opposite last page.

## THE NEW WAY TO DISPERSE, EMULSIFY and BLEND

What's the best method to disperse, emulsify or blend? It's all in Particle Control. No single piece of equipment will satisfy all requirements, so Gaulin offers three designs.

**Homogenizer** works at high pressures, uses tremendous velocity and energy gradients to create extreme concentrated turbulence to produce more uniform, stable emulsions and dispersions.

**Sub-Micron Dispenser** handles pigments and other abrasive dispersions. S-M-D Valve uses the same hydrokinetic principles as Homogenizer to produce dispersions of ultimate fineness.

**RE\* Colloid Mill** is a highly advanced, two-stage design which provides continuous micrometer control for producing superior emulsions or dispersions. Operation is greatly simplified, maintenance negligible.

**Laboratory Homogenizers and Colloid Mills** are available on rental basis. Use them to explore the dramatic new Gaulin dimension of Particle Control.

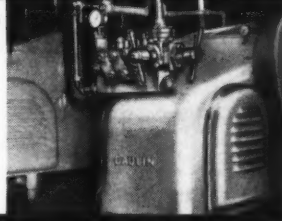
**Particle Control** plus GTA — Gaulin Technical Assistance — is the key to new savings, better quality in your processing.



Laboratory Homogenizers Ask for Bulletin LH-55



New Re\* Colloid Mills — Ask for Bulletin C-57



Homogenizers and Sub-Micron Dispenser Ask for Bulletins H-55 and SMD-55.



The G.T.A. Library of Product Information

FREE!

Ask for GTA and the Gaulin Library of Product Information . . . your best source for a low-cost solution to moving or mixing your product. Write or call today.

For technical data on Homogenizers and Sub-Micron Dispensers — Ask for Bulletins H-55 and SMD-55.

Manton-Gaulin offers complete research, laboratory and test facilities, plus 60 years' experience, to help you apply Particle Control for dispersions, emulsions and blends.

**MANTON-GAULIN MANUFACTURING COMPANY**  
33 Garden St., Everett 49, Mass.

Check 2281 opposite last page.



CHEMICAL PROCESSING



## NEW LITERATURE

### Do-it-yourself outfit makes photo prints

Bulletin of six pages, describes quick, easy method for making transparencies for overhead projectors from all types of original materials. Projecto-Printer Kit Bul — Ozalid Div., General Aniline & Film Corp., 8 Corliss Lane, Johnson City, New York.

Check 2282 opposite last page.

### Non-corroding sight glass

Bulletin describes properties, specifications, and applications of manufacturer's sight glasses that resist corroding and pitting effects of all chemicals except HF or strong, hot, caustic solutions. Bul EB-20 — Corning Glass Works, Corning, N.Y.

Check 2021 opposite last page.

### Fatty amine chemistry

Booklet of 24 pages discusses fatty amines, how they are made, and what they will do. Chemistry, vapor pressure, solubility, and handling are covered. "The Chemistry of Fatty Amines" — Chemical Div., Armour & Co., 1355 W. 31st St., Chicago 9, Ill.

Check 2283 opposite last page.

### Data sheets

Engineering data sheets contain information on manufacturer's equipment for BS&W Monitoring, pulp stock pump remote manual positioning, and phosphoric acid slurry measurement. Engineering data sheets—The Foxboro Co., Foxboro, Mass.

Check 2284 opposite last page.

### Fume hood data

Closed-type fume hoods used in laboratories are described. Fume Hood Data Sheet—Arthur S. LaPine & Co., 6001 S. Knox Ave., Chicago 29, Ill.

Check 2285 opposite last page.

# If you can

... pour it



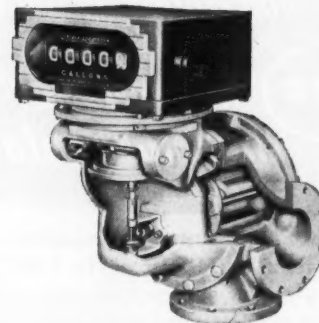
... or pipe it

## ROCKWELL CAN METER IT!

*including corrosive liquids*

Did you know that your company can save important money by using modern measurement methods in handling industrial liquids? With Rockwell meters you can batch, blend and control formulas with precision. You can guard your costly liquid inventories. You can control costs. And with Rockwell automatic quantity control valves you can save time and money on repetitive operations.

Why not investigate all the advantages of liquid metering in your plant? There's a size and type Rockwell meter for practically every service. Use the coupon or write for a free engineering analysis of your liquid handling operations.



ROCKWELL ROTOCYCLE METER  
Cutaway to show the all-revolving  
rotor construction



## ROCKWELL Industrial METERS

STAINLESS STEEL • STEEL • IRON • BRONZE

Check 2286 opposite last page.

CLIP COUPON—MAIL TODAY

ROCKWELL MANUFACTURING COMPANY Dept. 106L  
Pittsburgh 8, Pennsylvania

Gentlemen:

I am interested in measuring \_\_\_\_\_  
(Name of Liquid)

Pipe Size \_\_\_\_\_"  
Working Pressure \_\_\_\_\_ psi Temperature \_\_\_\_\_ °F max.  
Max. Flow Rate \_\_\_\_\_ gpm Min. Flow Rate \_\_\_\_\_ gpm

Your Name \_\_\_\_\_

Company \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

# Z O O S Z O S



Here's why more and more  
MUNSONS are doing the  
important mixing jobs

• Munson Mixers will quickly blend various chemical compounds into a homogeneous, accurate mixture, no reduction in particle sizes • They blend powders and granules • Spray pipes may be installed to spray liquids on dust and granular materials • Internal vent pipe to expel toxic fumes • Drum may be heated or cooled • Granular fertilizers can be coated with insecticide dust • Will blend chemicals, fertilizers, insecticides, herbicides, antibiotics, and many other materials • Available in several models • Low horsepower • 20 to 250 cu. ft. mixing capacity

TELL US YOUR MIXING PROBLEMS... write or phone for the complete story on Munson Rotary Batch Mixers.

**MUNSON MILL MACHINERY COMPANY**  
Dept. P-1157 210 Seward Ave., Utica, N.Y.

ROTARY BATCH MIXER

Check 2287 opposite last page.

control temperature to  $\pm 0.01^\circ\text{C}$   
with  
**PRINCO "magna-set"**  
thermoregulator

This new PRINCO Thermoregulator, covered by U.S. Patent No. 2,498,212, brings new accuracy, sensitivity and ease of adjustment to automatic temperature control. A rough adjustment is made by the mercury overflow chamber and a fine adjustment to  $\pm 0.005^\circ\text{C}$  is made by means of a rotating magnet.

With the PRINCO "Magna-Set" Thermoregulator properly designed agitated baths can be controlled to  $\pm 0.01^\circ\text{C}$  within the limits of minus 35 to plus  $300^\circ\text{C}$ .

write, wire or call for further details.

**PRECISION THERMOMETER & INSTRUMENT CO.**  
1414 BRANDYWINE STREET PHILADELPHIA 30, PA.  
Rittenhouse 6-6671

Check 2288 opposite last page.

## NEW LITERATURE

### Propeller fan data

Engineering and test facilities for propeller fans, and specifications, construction, maintenance, and installation data are contained in 24-page bulletin. Helpful tables for estimating air-handling requirements, entrance and elbow losses, and duct sizes are featured. Bul E-57—Aerovent Fan Co., Inc., Piqua 13, Ohio.

Check 2289 opposite last page.

### Spectroscopy

Reprint of 28 pages, bibliography on analytical flame spectroscopy, contains over 900 references arranged chronologically and alphabetically. Evolution of analytical flame spectroscopy is covered from 1848 up to date. Various fields of applications are conveniently indexed. Reprint R-100—Scientific Instruments Div., Beckman Instruments, Inc., 2500 Fullerton Rd., Fullerton, California.

Check 2290 opposite last page.

### Time-saving separation

How much unloading time you can actually save with manufacturer's centrifugal is charted in catalog that lists pertinent information on equipment. Batch-master Centrifugal cat — Tolhurst Centrifugals, Div. of American Machine and Metals, Inc., Dept. CPT-1157, East Moline, Ill.

Check 2162 opposite last page.

### Details crawler tractor

Cutaway view of manufacturer's diesel-powered torque-converter drive crawler tractor is feature of four-page specification sheet. Marginal notes along side of cutaway view point to many mechanical, design, and construction advantages. MS-1191 — Construction Machinery Div., Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

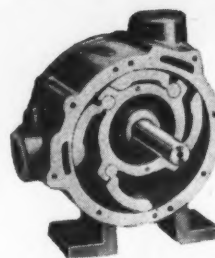
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## Automate with AIR

(Vacuum—Suction—Pressure)

Countless automatic operations are handled faster, simpler, more economically with

## LEIMAN Rotary Air and VACUUM PUMPS



Many types and sizes:

Vacuums to 29.9" Hg.

Pressures to 20" psig.

Displacement to 162 c.f.m.

- Lifting
- Holding
- Chucking
- Sorting
- Filling
- Separating
- Drying
- Feeding
- Mixing
- Many more

Send for 12-page Catalog and Application Book showing 60 "how-to-do-it" blue prints

Investigate the many uses and advantages of air for automatic operations—how other industries are using air—how you might use air. Your best source for such information is Leiman—with 60 years' background in the manufacture and application of air pumps. And the best pump for your job is a Leiman Air Pump for higher capacity—larger volume—trouble-free operation—longer life. Write for literature—outline your needs.

**LEIMAN BROS., Inc.**

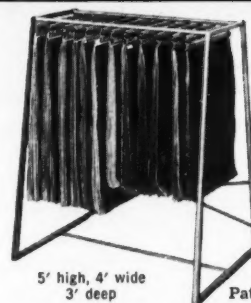
220 Christie St., Newark 5, N.J.

Check 2292 opposite last page.

## Holds 1800 Blue Prints

for QUICK filing  
**Glider**

BLUE PRINT FILE  
for: CONTRACTORS, ENGINEERS  
ARCHITECTS, DRAFTSMEN  
FACILITIES



5' high, 4' wide  
3' deep

Pat. Pend.

Created for savings in filing space, time and effort, Gliders are available for print widths of 20" to 48". Gliders obsolete peg-type filing and hole-punching.

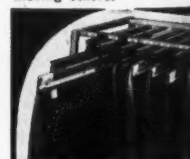
Your prints "glide" into place. Plan holders are retained from end-to-end, with no chance of bending or springing. Eye-easy indexes provide you with rapid reference.

All-steel Gliders, finished in a handsome grey, harmonize with modern office equipment. Extensions are available.

For longer print "life" and for efficiency, durability and economy in vertical filing, specify Glider. Order now through the best office suppliers or write for illustrated literature.



Through the direct clamp design of plan holders, you slip sheets, either singles or sets, in or out without removing others.



Plan holders "glide" in on steel tracks, are secured from end-to-end, and "glide" out with little effort.

**MOMAR INDUSTRIES**

4323 West 32nd St.  
Chicago 23, Ill.

Check 2293 opposite last page.

CHEMICAL PROCESSING

Counting inst  
Heavy duty  
and revolution  
electric counter  
coil winding  
automatic bat  
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Co., 702-04 W  
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Institute of  
Technology  
16, Illinois.  
NOVEM

## Counting instruments

Heavy duty electric, stroke, and revolution counters; electric counter actuators; small electric and stroke counters; coil winding counters; and automatic batch counters are in four-page catalog. Form AD 330—Production Instruments Div., General Controls Co., 702-04 W. Jackson Blvd., Chicago 6, Ill.

Check 2294 opposite last page.

## X-ray fluorescent tables

Book of 86 pages has complete X-ray fluorescent spectrometer conversion tables. Part 1 of two section book lists elements by ascending atomic number and relates them to proper two-theta angles. Part 2 lists ascending two-theta angles and relates them to the proper elements. To obtain X-ray Fluorescent Tables Book — remit \$2 direct to Instruments Div., Philips Electronics, Inc., 750 South Fulton Ave., Mt. Vernon, N. Y.

Check 2295 opposite last page.

## Chlorine handling data

Pertinent facts about chlorine, safety precautions, and recommended practices for designing and constructing chlorine supply systems are contained in 12-page manual issued by manufacturer of chlorination equipment. Bul WWC3B4 — Fischer & Porter Co., 230 Jacksonville Rd., Hatboro, Pa.

Check 2296 opposite last page.

## Gaseous fuel data

Results of exhaustive search of literature on theory of combustion, combustion phenomena, experimental investigations of various phases of combustion, and certain fundamentals important to burner design in connection with gaseous fuels are published in 72-page bulletin. To obtain Research Bul 15, remit \$5.00 direct to the Institute of Gas Technology, Technology Center, Chicago 16, Illinois.

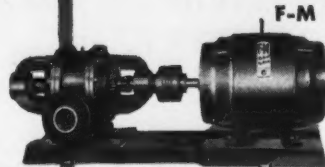
# Guide to better pump selection

for

specify

**boiler feed  
condensate return  
hot and cold liquids  
chemicals  
refrigerants, etc.**

up to 200 gpm.  
pressures to 900 ft.



## F-M WESTCO PERIPHERAL PUMPS

High pressure at normal operating speeds. Handle widely varying heads with little change in capacity. Sizes 1 1/4" through 2 1/2".

**hot and cold liquids  
liquid circulation  
nonviscous liquids  
boiler feed  
cooling towers, etc.**

up to 900 gpm.  
pressures to 525 ft.

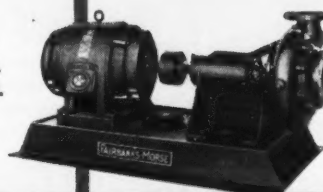


## F-M BUILTTOGETHER CENTRIFUGAL PUMPS

General-purpose, close-coupled pump and motor units mount in any position—horizontal, vertical or angular. Sizes 3/4" through 5".

**sewage  
slurries  
paper stock  
fruit  
shrimp  
vegetables, etc.**

up to 30,000 gpm.  
pressures to 175 ft.

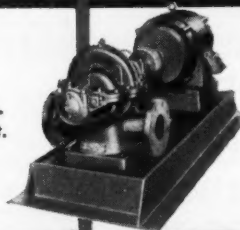


## F-M NON-CLOG PUMPS

Unexcelled for clog-free handling of liquids with solids in suspension. Sizes 2" through 20". Vertical or horizontal. Bladeless or conventional.

**water supply  
plant service  
booster  
circulating  
air conditioning  
refrigeration  
chemical liquids  
boiler feeds, etc.**

up to 50,000 gpm.  
pressures to 700 ft.

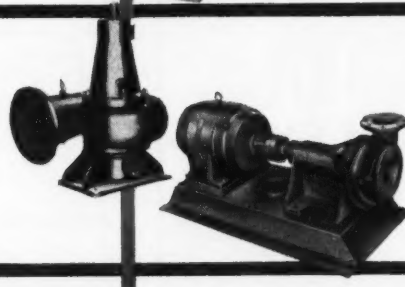


## F-M SPLIT-CASE CENTRIFUGAL PUMPS

High, sustained efficiency over wide range of conditions. Low-cost maintenance. Sizes 1 1/2" through 36". Single stage or multistage.

**hot and cold liquids  
chemicals  
circulating liquids  
nonviscous liquids  
cooling towers  
condenser circulation, etc.**

up to  
100,000 gpm.  
pressures  
to 250 ft.



## F-M END-SUCTION PUMPS

A wide line of rugged, precision-built pumps. Sizes 3/4" through 54". Horizontal or vertical centrifugal.

## FOR LOW-COST PUMPING SPECIFY FAIRBANKS-MORSE

Need new pumps? Your Fairbanks-Morse Dealer has the world's greatest variety for you to choose from. Need help in selection? Your F-M Dealer and F-M Sales Engineer will help specify the right type, right size pump and driver for low-cost, foolproof operation. Call them today, or write Fairbanks, Morse & Co., Dept. CP-11, 600 So. Michigan Ave., Chicago 5, Illinois.



# FAIRBANKS-MORSE

a name worth remembering when you want the BEST

PUMPS • SCALES • DIESEL LOCOMOTIVES AND ENGINES • ELECTRICAL MACHINERY • RAIL CARS • HOME WATER SERVICE EQUIPMENT • MAGNETOS

Check 2297 opposite last page.



## ON THE SPOT HEAT to your exacting requirements!

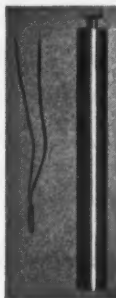


### TRENT STRIP HEATERS

for Ovens, Dryers, Kettles, Process Equipment

- Flat Metallic Tube Casing
- Ceramic Block Terminal Blocks
- No Grooves—No Heat Distortion
- Sealed End Construction

Available in a complete range of types and sizes, wattage requirements, and voltage conditions—for maximum safe surface temperatures of 750°F. and 1000°F!



### TRENT CARTRIDGE HEATERS

for Dies, Molds, Platens, Sealers, Defrosting

- Brass or Steel Sheath Construction
- Nickel Chromium Heater Coil Sealed in Ceramic Insulation
- Silver Soldered End Opposite Terminals
- Moisture and Wax Resistant
- Brass Angle, Pigtail, Rod, or Stud Type Terminals

Standard sizes from 3/8" to 1 1/4" diameter, and 1 1/2" to 22" in length, are supplied in a range of wattage requirements for 110 and 220 volt operation.

Discuss your spot heating requirements with a Trent representative.

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Coast to Coast

**TRENT INC.**  
Electrically Heated Industrial Equipment  
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In Canada: Supreme Power Supplies Limited, Toronto 14

Check 2298 opposite last page.

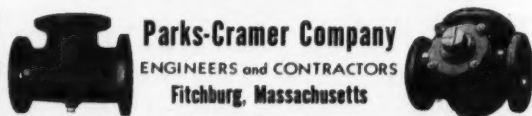
## Viscous Materials FLOW LIKE WATER through Parks-Cramer Jacketed Pipe and Fittings

You can't find a better way to convey asphalt, rosin, wax, sulphur, gums, syrups, or other high melting point solid or viscous materials than through Parks-Cramer jacketed lines.

Increased variety of jacketed piping specialties is now available. Range of materials also increased to include Ductile Iron, Ni-Resist, Steel and Stainless Steel. Redesigned valves and fittings improve efficiency and performance. New catalog covering changes available.

### See This Equipment Booth 55

at the Chemical Show, Dec. 2-6



**Parks-Cramer Company**  
ENGINEERS and CONTRACTORS  
Fitchburg, Massachusetts

Check 2299 opposite last page.

## NEW LITERATURE

### On-the-spot patching

Manufacturer's bulletin describes 1001 uses for plastic and steel patching compound for on-the-spot repairs of tanks, pipe, broken metal parts, pumps, boiler jackets, radiators, etc. Plastic Steel® bul — Devcon Corporation, 135 Endicott St., Danvers, Massachusetts.

Check 2262 opposite last page.

### Anhydrous ammonia

Technical data book describes anhydrous ammonia and ammonia liquor, listing (in 68 pages) their chemical and physical properties, specs, handling and storage features, unloading methods, and analytical procedures. Bibliography is included. "Ammonia"—Nitrogen Div., Allied Chemical and Dye Corp., 40 Rector St., New York 6, N.Y.

Check 2300 opposite last page.

### Filters for missiles

Micro-magnetic filters, designed specifically for missiles, aircraft, and other airborne applications, are described in six-page folder. Units trap sub-micronic ferrous particles by magnetic action and provide mechanical filtration of 10 microns or finer. Cat 54-100 — Cuno Engineering Corp., S. Vine St., Meriden, Conn.

Check 2301 opposite last page.

### Automation discussed

Booklet covering speech on automation meaning and implications before Miami Chapter of American Materials Handling Association by James C. Vadakin, Ph. D., Professor of Economics, University of Miami, will be of value to anyone interested in material handling automation. "Automation, Its Meaning and Implications" — Island Equipment Corp., 27-01 Bridge Plaza North, Long Island City 1, New York.

Check 2302 opposite last page.

## Adjustable **conax** PIPE CLAMP THERMOCOUPLE



for accurately  
reading outside  
pipe temperatures

### advantages

- Used wherever immersion thermocouples are impractical or undesirable
- Used where extreme corrosion and erosion are problems
- Provides temperature readings on alloy, plastic or glass pipes that are not easily entered
- High pressure lines unbroken—a safety feature
- Installation and service without interrupting operations or flow
- Permits checking other temperature measuring devices
- Checks effectiveness of insulation
- Multiple units readily used for obtaining temperature gradients
- Installed in less than a minute

Thermocouples available in Copper-Constantan for low temperatures or Iron-Constantan and Chromel-Alumel up to 1000° F.



WRITE FOR CONAX DATA  
BOOK SHOWING COM-  
PLETE LINE OF THERMO-  
COUPLE ASSEMBLIES AND  
PRESSURE SEALING  
GLANDS.

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corporation

2314 Walden Ave., Buffalo 25, N. Y.

Check 2303 opposite last page.

## It's NEW! It's EXCLUSIVE!

A 100%  
PVC CHECK  
VALVE



RUGGED  
VERSATILE  
TIGHT SEALING  
LOW PRESSURE DROP

## Technocheck-PVC WILL LAST THE LIFE OF ANY PVC LINE!

Technocheck is an exclusive valve principle developed and controlled by Techno Corp. It is employed in polyvinyl chloride and in a variety of metals as well. In polyvinyl chloride, Technocheck is as resistant to corrosive gases, vapors and fluids as the piping system itself because the entire valve is made of PVC.

Valve is rugged, versatile, tight sealing and operates on low pressure differential. Made in sizes from 1" to 8" with flanged or threaded ends. Write for Bulletin: Technocheck-PVC.

**Techno Corporation**  
36 WEST 37TH STREET, NEW YORK, N.Y.

Check 2304 opposite last page.

CHEMICAL PROCESSING

**X**  
**COUPLE**

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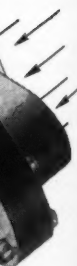
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**RUGGED**  
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**ESSURE DROP**

**VC LINE!**

versatile, tight  
es on low pres-  
Made in sizes  
ith flanged or  
rite for Bul-  
-PVC.

TH STREET, BIR. PA

CESSING

### Chain, sprocket catalog

Manufacturer's line of stock roller chains and sprockets are described and illustrated in 68-page catalog. Typical data includes how to select a stock roller chain drive, establishing service horsepower required, and determining size of division sprocket. Cat 757—Diamond Chain Co., Inc., 402 Kentucky Ave., Indianapolis 7, Indiana.

Check 2305 opposite last page.

### Nuclear economics

Four-page report discusses economic future of nuclear power in terms of three-phase classification system — development period, critical period, and "golden age". "The Economic Geography of Nuclear Power" — Nuclear Div., The Martin Co., Baltimore 3, Maryland.

### '1'-Butanol

Twelve-page bulletin gives data, specs, constant-boiling mixtures, physical property charts for "1"-Butanol. Folder F-7909 — Union Carbide Chemicals Co., Dept. CP, 30 E. 42nd St., New York 17, New York.

Check 2306 opposite last page.

### Plastic tube

Card contains sample of plastic tube for laboratories, hand torches, lathe burners, bench burners, and glass shops. Features, specifications, and prices are included. Sample card—Bethlehem Apparatus Co., Inc., Hellertown, Pa.

Check 2307 opposite last page.

### Small liquid filters

Manufacturer's line of small corrosive liquid filters are subject of two-page bulletin. Bul 506—R. P. Adams Co., Inc., 343 Park Drive, Buffalo 17, New York.

Check 2308 opposite last page.

## No special equipment... No special training needed



Joining problem on sub-zero oil eliminator solved with Inco-Rod "A" electrode. Above shows 36-pound end head and 113-pound slip-on flange (both extra-heavy mild steel) which were welded to a 12-inch stainless steel pipe. Unit designed to work at minus 50° F. and 500 psi.

## Welds dissimilar alloys for sub-zero service with versatile Inco-Rod "A"

This welder is completing the fabrication of an oil eliminator used to remove oil from a liquefied petroleum gas stream. Working temperatures in the unit: minus 50° F. Working pressures: 500 psi.

The end cap and slip-on flange are mild steel (A 350 Grade C). The outer casing is stainless steel (type 304).

### Inco Rod "A" produces high strength welds

The whole job was done with Inco Rod "A". No special equipment or training was necessary. Welds have high strength and are capable of withstanding sub-zero temperatures and 500 psi pressures.

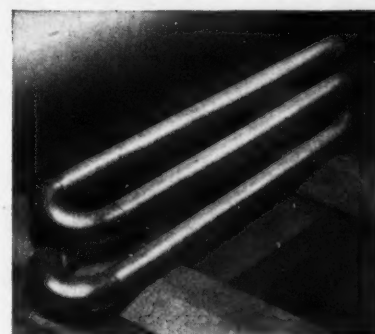
### What's your joining problem?

Forged steel to high alloys? Stain-

less to carbon steel? Whatever it is you'll get strong, ductile welds... corrosion resisting... of X-ray quality with Inco Rod "A" electrode. What's more, welds have excellent properties at both sub-zero and elevated temperatures.

Handy packages — supplied in 5-lb. sealed, tubular, asphalt-lined containers. Available in 3/32", 1/8", 5/32" and 3/16" diameters.

To get a better idea of the many ways this welding electrode may be able to help you, write for our new folder, "Inco Rod 'A' Electrode." It's illustrated with dozens of case histories describing how Inco Rod "A" Electrode solves problem welds such as may be facing you. It also lists test data on 23 combinations of dissimilar alloys which can be joined with this electrode.



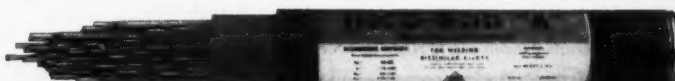
Interior is made by joining 1½" tubing (304 Stainless Steel) and 180° U-bends (mild steel) Fabricator: Sparling Tank Ltd., New Toronto, Canada.

\*Registered trademark

The International Nickel Company, Inc.  
67 Wall Street New York 5, N. Y.



electrodes • wires • fluxes

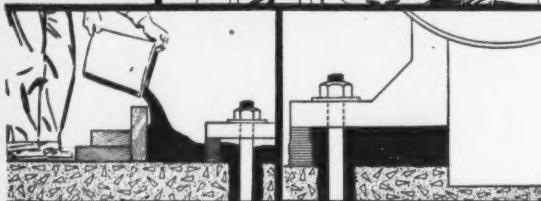


## INCO WELDING PRODUCTS

Check 2309 opposite last page.



## SUCCESSFUL EQUIPMENT GROUTING easy as 1-2-3



1. **READY-TO-USE.** Add only water to Embeco Pre-Mixed Grout, mix and place to produce a...
2. ... **FLOWABLE** easily-placed grout that hardens as a...
3. ... **NON-SHRINK** grout of high compressive and impact-resistant strength.

### EMBECO PRE-MIXED GROUT

... Gives lasting results on every grouting job: heavy equipment, machinery, anchor bolts, building columns, bridge seats, etc.

Write for Free Grouting Guide.

DIVISION OF AMERICAN-MARIETTA COMPANY



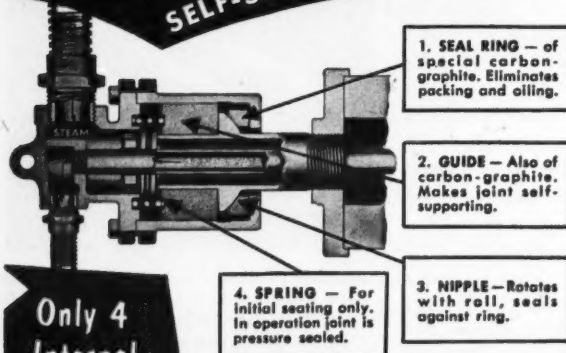
**the MASTER BUILDERS CO.**

CLEVELAND 3, OHIO

TORONTO 15, ONTARIO

Check 2310 opposite last page.

## JOHNSON Rotary Pressure JOINT SELF-SUPPORTING TYPE



**Only 4  
Internal  
Parts**

1. **SEAL RING** — of special carbon-graphite. Eliminates packing and oiling.

2. **GUIDE** — Also of carbon-graphite. Makes joint self-supporting.

4. **SPRING** — For initial seating only. In operation joint is pressure sealed.

3. **NIPPLE** — Rotates with roll, seals against ring.

For introducing steam and liquids into rotating rolls and cylinders, there's nothing like the Johnson Joint above. It's packless, self-lubricating, self-adjusting, self-supporting. It has been

adopted by dozens of machinery makers, and is finding new uses every day.

Type SB shown handles both steam and condensate through same head; also available for through flow service, and in sizes and styles for all operating conditions. *Write for literature.*

**The Johnson Corporation**

326 Wood St., Three Rivers, Mich.

Check 2311 opposite last page.

## NEW LITERATURE

### Save filter downtime

Manufacturer's bulletin gives complete information on horizontal plate filter for quick solids removal. "Batch Mixer" bul — Niagara Filters, Div. of American Machine and Metals, Inc., Dept. CP-1157, East Moline, Illinois.

Check 2161 opposite last page.

### 'Up and over' conveyor

How manufacturer's elevating bucket-type conveyor equipment solves various bulk handling problems is described and illustrated in six-page folder. Unique feature of bulletin is chart in which actual material handling problem may be diagrammed by potential user for analyses and recommendations by manufacturer's engineers. Robo-lift Folder — Lynch Robo Corp., Div. of Lynch Corp., 2304 Crystal St., Anderson, Indiana.

Check 2312 opposite last page.

### WANT MORE INFORMATION...

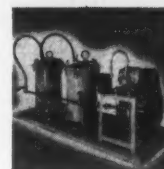
... about things you read about in the New Literature Section?

### Here's How to Get It

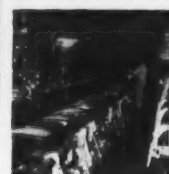
Note the number in last line of each new literature review. Check this key number on Reader Service Slip opposite last page of this issue. Fill in the Slip with the other pertinent information (name, title, company, address, product made). Mail to our Reader Service Department.

We'll contact the manufacturer for you, telling him you'd like a copy of the bulletin. He'll send it direct to you.

## Whatever You Need Vacuum For



Vacuum  
Impregnating



Vacuum  
Processing



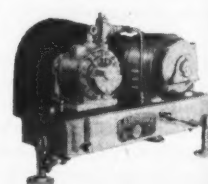
Vacuum  
Packaging

## You Can Get It For Less With a LAMMERT PUMP

Capacities from 4.3 to 225 cubic feet per minute. From medium to high vacuum (up to 20 microns of barometer).



Write for catalog giving specifications of Lammert Vacuum pumps and compressors.



**LAMMERT & MANN CO., INC.**

1753 Walnut Street, Chicago 12, Illinois, SEeley 3-0383

Check 2313 opposite last page.

## BRIEFS...

*from contemporary  
publications*

READ THEM... IN THIS ISSUE

You get a "quick-look" at the most valuable articles being published in this field, and kindred fields... by reading the "BRIEFS" section of **CHEMICAL PROCESSING** every month.

Our Editors read more than 50 contemporary publications every month... select those articles they believe you will want to know about... and, in terse style, they tell you about them. Name of publication and issue are given so you can read those you want to know more about.

It's a monthly service... to save you time... yet keep you informed.



### Polyglycol fatty esters

Up-to-date brochure on series of polyglycol fatty esters tabulates physical and chemical properties. These nonionic surfactants act as pigment-dispersing agents in leather industry. In textile field they perform as staple fiber lubricants, as well as levelers and dispersants for dyestuffs. Nopalcols — Nopco Chemical Co., Harrison, New Jersey.

Check 2315 opposite last page.

### Elevator conveyor

Manufacturer's four-page bulletin describes and illustrates elevator conveyor that can be adapted to cramped space and one-floor operation. Features are pointed out and dimensional drawings included. Elevator Conveyor Bul — Haysen Mfg. Co., Sheboygan, Wis.

Check 2316 opposite last page.

### Packaged steam generators

Manufacturer's packaged steam generators, factory assembled, automatic-gas or oil-fired, are illustrated and described in 8-page bulletin. Bul SB-56 — Erie City Ironworks, Erie, Pa.

Check 2317 opposite last page.

### Lab equipment catalog

Lab electrobalance, photomicrography illuminator, AC line-operated spectrophotometer, freeze-dry equipment, and constant temp bath are described in 16-page catalog. Lab Log No. 4 — Will Corp., Rochester 3, N.Y.

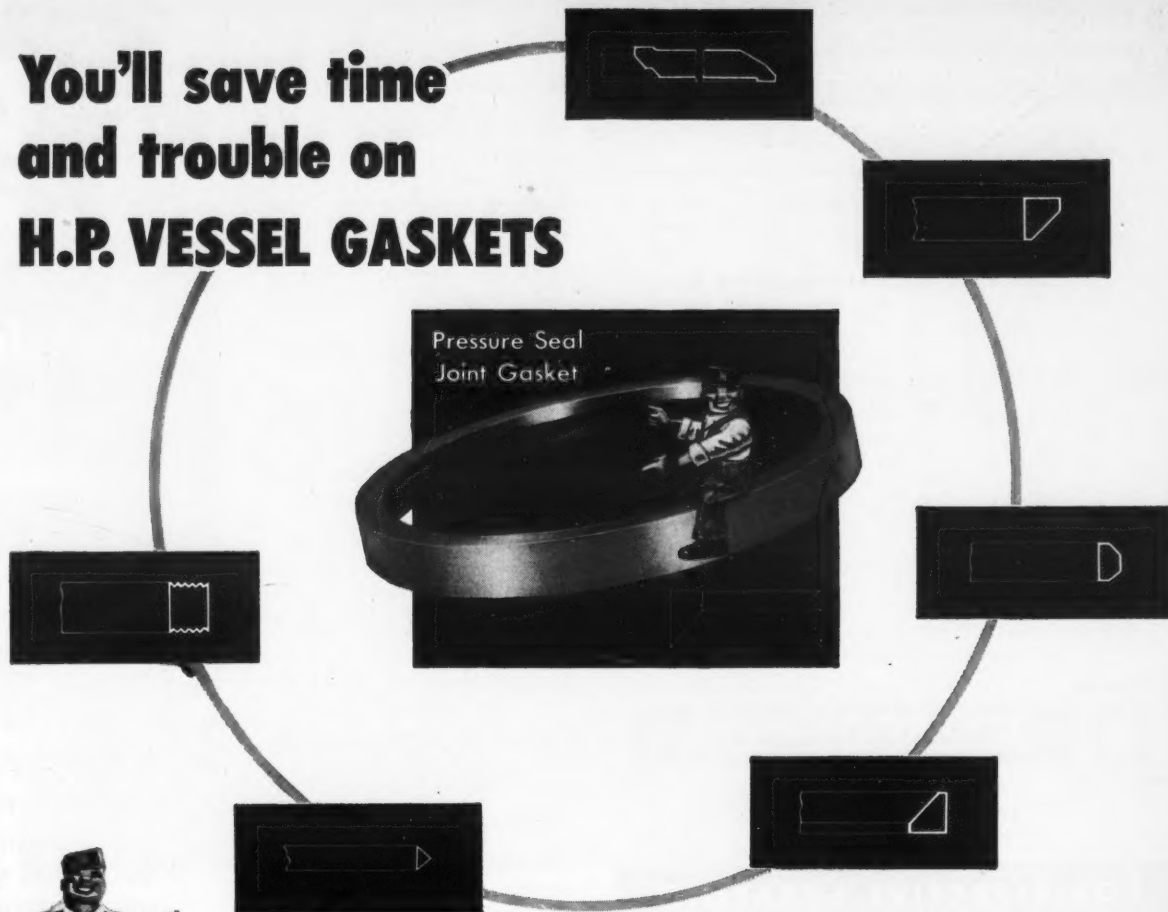
Check 2318 opposite last page.

### Corrosion-resistant lining

Information on manufacturer's rubber tank lining and corrosion-resistant sheeting is presented in 20-page bulletin. Product Bul — Rhee Elastic Thread Corp., 130 Franklin St., Warren, Rhode Island.

Check 2319 opposite last page.

## You'll save time and trouble on H.P. VESSEL GASKETS



**...when J-M Goetze gasket specialists make them for you**

When you need gaskets such as those above, which were made for pressure vessel service over 5000 psi, consider this. It takes less time and trouble to turn the job over to J-M Goetze — an organization that has specialized in gasket design and manufacture for 67 years. And it usually costs less in the long run.

Goetze engineers can select the right style for maximum sealing efficiency. They know the correct metals and other factors required for efficient, long-lasting gaskets.

*Goetze Gaskets are made exactly to the last detail of your specifications and conditions. They are made to craftsmen's perfection . . . with modern machine tools, some of which were specially designed by Goetze for gasket manufacture.*

If you need gaskets for high pressure vessels or similar applications, send us a drawing or template for quotation. Or write for further information to Johns-Manville, Box 14, New York 16, New York.



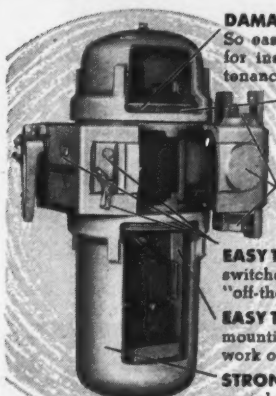
**Johns-Manville PACKINGS, GASKETS and TEXTILES**

Check 2320 opposite last page.

## NEW SPIN TOP ENCLOSURE FOR HAZARDOUS LOCATIONS

### 4 SIZES for Starters 0 thru 5

CLASS I, GROUP C and D • CLASS II, GROUP E, F, and G



**DAMAGE-RESISTING** Acme thread. So easy to put on and take off tanks for installation, inspection or maintenance.

**REAL PROTECTION** against rain, dust, dirt and weather because male threads on collar section engage female threads on tank.

**INCREASED WIRING SPACE** and through-feed conduit entrances for horizontal tap-offs.

**EASY TO ADD** pushbuttons or selector switches with easy-to-buy, easy-to-use, "off-the-shelf" parts kits.

**EASY TO INSTALL**—"Slide and Hook" mounting arrangement takes the hard work out of the installation job.

**STRONG and LIGHTWEIGHT** • The complete enclosure is cast aluminum.

Write for BULLETIN 9990. Square D Company,  
4041 North Richards St., Milwaukee 12, Wis.



NOW... EC&M PRODUCTS ARE A PART OF THE SQUARE D LINE

**SQUARE D COMPANY**

Check 2321 opposite last page.

## FOR EFFECTIVE SPRAYING AT LOWER COST



*remember final control is  
the SPRAY NOZZLE you use!*

In design... choose the Spray Nozzles that give you proper performance, with exact spray pattern, impact, spray angle and capacity. In application... be sure the nozzles as supplied are produced to close tolerances. Metallurgically, make certain the spray nozzles fit your use.

With Spraying Systems you can be sure of spray nozzles to meet all three requirements. Let Spraying Systems Co. recommend Spray Nozzles to meet your needs best.

**YOUR GUIDE TO SPRAY NOZZLE SELECTION**  
Spraying Systems Co. Catalog No. 24...  
48 pages, with complete performance data.  
Write for your free copy.

**SPRAYING SYSTEMS CO.**  
3216 RANDOLPH STREET • BELLWOOD, ILLINOIS



FOR EFFICIENT SPRAYING MAKE SURE THE NOZZLE IS RIGHT

Check 2322 opposite last page.

## NEW LITERATURE

### De-watering problem?

Information on how to obtain assistance if you have a drying or cooling problem can be found in manufacturer's catalog that lists drying and cooling equipment and services. Cat C — Davenport Machine and Foundry Co., Davenport, Iowa.

Check 2100 opposite last page.

### X-ray techniques

Folder of four pages deals with problems related to pulse height analyzers used in X-ray work. Construction of analyzers, their application and limitations are discussed. Graphs and tables help explain operation. X-ray Technique Bul — Instruments Div., Philips Electronics, Inc., 750 S. Fulton Ave., Mt. Vernon, N. Y.

Check 2323 opposite last page.

### Flavor, perfume materials

Manufacturing, control, and service operation in production and handling of essential oils and aromatic chemicals are presented in 52-page brochure. "Fritzsche Values" — Fritzsche Brothers, Inc., 76 9th Ave., New York 11, N. Y.

Check 2324 opposite last page.

### Vinyl coating data

Bulletin of four pages lists physical properties and describes manufacturer's line of vinyl protective coatings. Vinyl Coating Bul — Hauger-Beegle Associates, Inc., 900 W. 49th Place, Chicago 9, Illinois.

Check 2325 opposite last page.

### Valve lubricant catalog

Illustrated 16-page catalog gives lubricant recommendations for nearly 4000 service conditions for which lubricated plug valves can be used. Reference Book 39, Section 5A—Homestead Valve Mfg. Co., Coraopolis, Pa.

Check 2325A opp. last page.

**Quickdraft...**

**THE WORLD'S MOST EFFICIENT POWER EXHAUSTER**

**...for industry... for institutions... for residences**

★ NO MOTORS, FANS OR BEARINGS IN EXHAUST LINE  
★ NEEDS NO STACKS ★ ACID RESISTING VITREOUS ENAMEL FINISH

FOR INDUSTRY, Quickdraft excels in venting paint booths... abrasives... corrosive gases... noxious fumes... high temperatures and moisture. Its blower operates in clean or outside air. It eliminates down-time for cleaning and replacing fan blades. It improves industrial venting and reduces maintenance costs!

FOR INSTITUTIONAL AND COMMERCIAL BUILDINGS, Quickdraft efficiently vents heating plants, water heaters and incinerators at roof level. It saves the cost of building unsightly tall stacks.

FOR RESIDENCES, Quickdraft makes low, cold and erratic chimneys function. On and off with the fire, Quickdraft maintains constant draft required for efficient and economical combustion of all fuels. It eliminates pulsating or chattering, puffing, smoking and sooting.

SEND FOR QUICKDRAFT ENGINEERING DATA ON YOUR VENTING OR HEATING APPLICATIONS... TODAY.

**IMPORTANT NOTICE**

In addition to standard acid resisting vitreous enamel finish, all Quickdraft units are available in No. 316 Stainless Steel or in rigid plastics such as P.V.C. Plastics and fiberglass coatings are also available for withstanding highly corrosive gases. With static pressures up to 12-inches, Quickdraft is ideal for materials handling applications.

**THE Quickdraft CORPORATION**  
P. O. Box 87-Q • Canton 1, Ohio



**THE Quickdraft CORPORATION**  
P. O. Box 87-Q • Canton 1, Ohio

Check 2326 opposite last page.

CHEMICAL PROCESSING

## NEW LITERATURE

### Industrial X-ray equipment

Bulletin of four pages describes and illustrates industrial X-ray equipment for radiographic inspection of castings, welds, assemblies, and metal products. Photographs show applications of equipment. X-ray Equipment Bulletin—Mitchell Radiation Products Corp., 128 E. Washington St., Norristown, Pa.

Check 2327 opposite last page.

### Epoxy adhesives

Four-page brochure describes properties of high strength bonding agents based on an epoxy formulation. "Resiweld Adhesive" Bulletin—H.B. Fuller Co., 255 Eagle St., St. Paul, Minnesota.

Check 2328 opposite last page.

### Laboratory scales

Data sheet of two pages describes and illustrates balances for analytical laboratory weighing to 1/100,000 of capacity, and for bulk weighing and dispensing to 1-kg capacity. Balance Data Sheet—Arthur S. LaPine & Co., 6001 S. Knox Ave., Chicago 29, Ill.

Check 2329 opposite last page.

### Titanium features

Handy 24-page pocket-size booklet gives key data on titanium's advantages, corrosion and other properties, metallurgy, and machining. "Titanium Fact File"—Malloy-Sharon Titanium Corp., Niles, Ohio.

Check 2330 opposite last page.

### Describes crystallizers

Illustrated bulletin of 20 pages describes all types of company's crystallizers. Product control, operation, applications, and other pertinent data are included. Crystallizer bulletin—Struthers Wells Corp., Warren, Pa.

Check 2166 opposite last page.



## No Repairs in a Full Year of Round-the-Clock Service

In the chlorinated products division of Diamond Alkali Company at Painesville, Ohio, these LaBour Type G pumps—purchased in 1948—are on continuous duty, lifting chlorinated solutions to the cooling towers above the mixing tanks. Each of the four pumps lifts about 120,000 gallons per day, to dissipate heat produced by introduction of the chlorine into the process of manufacturing chlorowax, carbon tetrachloride and anhydrous hydrochloric acid. Ten other LaBour pumps serve other divisions of the

Painesville plant.

In 24-hour service atop the 15,000-gallon mixing tanks, the LaBour pumps take a beating, but they deliver the work they were bought to do. Sometimes a full year goes by without the necessity for any repairs or replacement parts. LaBour Type G is packingless, so there is never any need for servicing to prevent packing leaks.

If you are looking for this kind of dependable, low-cost service in your liquid moving operations, get in touch with LaBour.

ORIGINAL MANUFACTURERS OF THE SELF-PRIMING CENTRIFUGAL PUMP

# LABOUR

THE LABOUR COMPANY, INC. — NEWARK, N.J. — U.S.A.

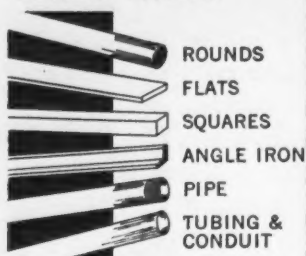
Check 2331 opposite last page.



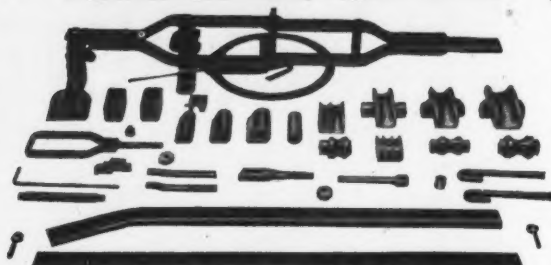
# 1 MAN + 1 BENDER

**BENDS THESE:**

- Wrenchless, ready to use.
- Practical, quickly set up.
- Adaptable, replaces special equipment.
- Versatile, 141 different dies available.
- Dependable, a must for maintenance, limited production.
- Invaluable, optional equipment makes jobs easier.



**HOSSFELD UNIVERSAL® IRON BENDER**



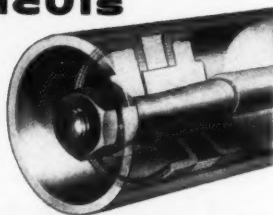
BENDER SHOWN WITH REGULAR EQUIPMENT

**FREE:** WRITE FOR **HOSSFELD MFG. CO.**  
BULLETIN 450 W. THIRD STREET, WINONA, MINNESOTA

Check 2332 opposite last page.

## KEEP EFFICIENCY HIGH with DARCOVA

**Pumcups**



A LOT of dollars go slipping right past the pistons of reciprocating pumps and cylinders that must be frequently repacked. But Darcova Pumcups keep pump efficiency up, hold slippage and maintenance down!

Because of Darcova's unique design, true texture engineering and precision manufacture, Pumcups outlast other packing at least 3 to 1.

Why not judge for yourself? Get all the facts. Send today for informative Bulletin No. 5503.

**DARLING VALVE & MANUFACTURING CO.**  
Williamsport 4, Pa.



TRADE MARK  
**Pumcups**

Check 2333 opposite last page.

## NEW LITERATURE

### Jar-mill catalog

Mill for economically grinding, pulverizing, or mixing multiple batches of similar or different materials simultaneously is described and illustrated. Cat 79 — Abbé Engineering Co., Dept. 46, 50 Church St., New York 7, N.Y.

Check 2143 opposite last page.

### Germanium rectifier

Bulletin of 14 pages describes and illustrates manufacturer's line of germanium power rectifier junctions. General application data and specifications are included. Bul GPR-2 — International Rectifier Corp., El Segundo, Calif.

Check 2334 opposite last page.

### Nuclear fuel elements

Technical paper of 10 pages presents theoretical comparison of tubular and flat-plate fuel elements from standpoint of heat transfer and fluid flow. "Tubular vs Plate Fuel Elements: Heat Transfer & Flow Analysis" — Nuclear Div., The Martin Company, Dept. CP, Baltimore 3, Md.

Check 2335 opposite last page.

### Dust separator data

Bulletin of 12 pages discusses design improvements and applications of manufacturer's heavy-duty, cyclonic, dust separator. Operational and performance data, as well as a selection chart, are included. Bul 576 — The Day Sales Co., 810 Third Ave. N. E., Minneapolis 13, Minn.

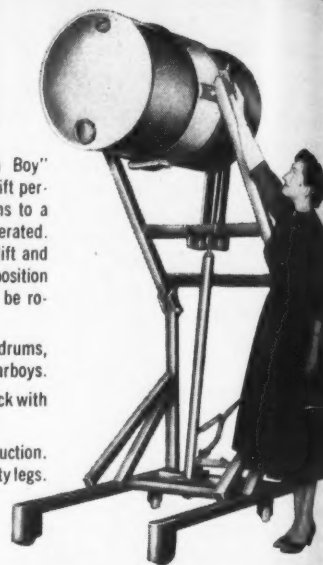
Check 2336 opposite last page.

### Versatile plastic material

Bulletin of 10 pages features over a dozen tables of properties on "Kel-F" halofluorocarbon polymers. Applications are discussed. "Kel-F" Bul — Minnesota Mining and Mfg. Co., 900 Bush St., St. Paul 6, Minnesota.

Check 2337 opposite last page.

## LIFT DRUMS HIGH



The Model BM 3 "High Boy" Sterling Hydraulic Drum Lift permits SAFE lifting of drums to a height of 72". One-man operated. Stack drums two high or lift and lock drum in pouring position at any height. Drums can be rotated 360°.

Easy Lock Girdles for drums, containers, cylinders or carboys.

Heavy-duty Hydraulic Jack with 750 lb. lifting capacity.

Rugged all steel construction. Roller bearing casters. Safety legs.

**SAFE! PORTABLE! EASY TO USE!**

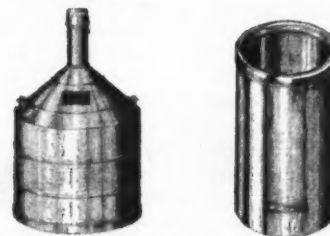
For complete details and specifications write

**STERLING, FLEISCHMAN CO.**  
BROOMALL, PA.

Check 2338 opposite last page.

## SUPAIRCO CONTAINERS

for liquid oxygen, nitrogen, air, helium, hydrogen . . . and dry ice



SUPAIRCO containers are designed to ensure minimum loss rate. Evaporation rate of liquified gas varies from 7% per 24 hours in smaller sizes to less than 1% per 24 hours in larger storage containers. Made in capacities up to 3,000 gallons. Dewar flasks from 1/2 liter to 50 liter capacity, and in special sizes to meet requirements.

Free catalog on request

**SUPERIOR AIR PRODUCTS CO.**

132 MALVERN STREET • NEWARK 3, NEW JERSEY • U.S.A.

Manufacturers of production and storage equipment for gases and liquids: oxygen, nitrogen, air, hydrogen and helium

Check 2339 opposite last page.

CHEMICAL PROCESSING

## NEW LITERATURE

### Dry processing equipment

Information on crushing and grinding machines, fertilizer machinery, laboratory reduction mills, and automatic coal sampler is contained in eight-page catalog. Use of air separators in closed-circuit grinding, micronizer fluid energy mills grinding, and rotary batch blenders is described in detail. Dry Processing Equipment Cat — Sturtevant Mill Co., Boston 22, Massachusetts.

Check 2340 opposite last page.

### Leak detection service

Manufacturer's bulletin presents information on custom service for detecting and locating leaks in vacuum or pressure equipment. Service is designed for test of prototypes, development models, pilot models, special laboratory equipment, etc. Bul 1844 — Consolidated Electrodynamics Corp., 300 N. Sierra Madre Villa, Pasadena, California.

Check 2341 opposite last page.

### Re-designed apron feeders

More than 50 types and sizes of re-designed apron feeders and two sizes of portable apron feeders are described in manufacturer's eight-page bulletin. Specifications, capacities, and horsepower requirements are included. Form 662 — Pioneer Engineering, Div. of Poor & Co., Inc., Minneapolis 14, Minn.

Check 2342 opposite last page.

### Laboratory balances

Analytical, projection, and speed balances, exposure meters, and low-power micro manipulators are detailed in manufacturer's bulletins. Balance, exposure meter, and manipulator buls—C. A. Brinkmann & Co., 376-380 Great Neck Rd., Great Neck, Long Island, New York.

Check 2343 opposite last page.

### ENTOLETER DIVISION

Constantly aware of the chemical industry's effort to provide its customers with the best products possible, these divisions of Safety Industries, Incorporated

- Entoleter Division
- The Howe Scale Company
- Lighting Division
- Automatic Timing & Controls, Inc.

### THE HOWE SCALE COMPANY

pledge their research and manufacturing facilities . . . to a continuing program of product development and to the production of quality equipment, competitively priced . . . to meet the exacting requirements of the chemical industry and its management's long range objectives.

**ENTOLETER DIVISION** . . . manufacturers of "Entoleter" Centrifugal Machines for high speed dispersion and for the particle size reduction of free-flowing dissimilar solids, heat sensitive materials and crystalline solids. Designers and manufacturers of complete dust recovery systems.

**THE HOWE SCALE COMPANY** . . . producers of automatic batch weighing equipment and a complete line of general industrial scales including the newest electronic and automatic scales for the chemical and allied industries.

**LIGHTING DIVISION** . . . manufacturers of Infra-Red Oven Sections for the application of radiant heat to product baking, heating and drying. These units can be combined to meet batch-type baking requirements, assembled in contoured combinations to accommodate conveyor operations, or purchased as complete portable ovens.

**AUTOMATIC TIMING & CONTROLS, INC.** . . . manufacturers of timers and highly sensitive electronic devices for the automatic control, recording and/or indication of industrial operations.

SEE US AT THE CHEMICAL SHOW . . . BOOTH 645  
NEW YORK, DECEMBER 2-6



## SAFETY INDUSTRIES, INC.

FORMERLY THE TAYLOR CHEMICAL AND LIGHTING COMPANY, INC.

P. O. BOX 904

NEW HAVEN 4, CONNECTICUT

Check 2344 opposite last page.





## Worcester's New Econ-O-'Miser" Ball Valve\* is BOTH VALVE and UNION

The costs of a union and installing it are eliminated. Add to this the longer operating life of the Econ-O-'Miser, the time and materials savings of *in-line maintenance*, and you get performance unmatched by any valve at any price.

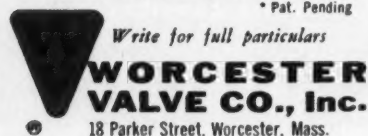
The Econ-O-'Miser" is available in Bronze, Aluminum, Aluminum Bronze, Forged Carbon Steel, types 303 and 316 Stainless Steel. Seat and seal materials available: Teflon, Buna-N and Neoprene (others available on request.)

The many combinations of body and seat seal materials allow handling of exceptionally wide range of media.

### Other Outstanding Features

- Compact for ease of installation
- Positive leakproof shut-off
- *In-line maintenance* permits quick, easy inexpensive repairs
- Two-way flow allows application of pressure or vacuum to either side of valve
- Quarter turn operation — readily adaptable to remote control
- Visual determination of OPEN — CLOSED positions — No manual check needed
- Round flow through the valve — minimum pressure loss and turbulence
- "Wiper-action" of resilient seat against ball eliminates abrasive wear due to foreign materials in media . . . assures leak-proof seal . . . long operating life

\* Pat. Pending



Check 2345 opposite last page.

## NEW LITERATURE

### Controllers, recorders

Full-page table of applications for company's line of ring balance recorders, indicators, and controllers is feature of six-page bulletin. Advantages of equipment are explained and illustrated. Bul MSP-141—Hagan Chemicals & Controls, Inc., 323 Fourth Ave., Pittsburgh, Pennsylvania.

Check 2346 opposite last page.

### Solvent data

Toxic concentrations, chemical analysis, and specs of manufacturer's solvents for insecticide formulation are contained in 24-page bul. Solvent Bul—Eastern States Chemical Corp., PO Box 5008, Houston 12, Tex.

Check 2347 opposite last page.

### Chemical pump facts

Applications, features, and description of manufacturer's pumps, said to fill 85% of all chemical pumping needs, are presented in factual manner. Bul S-1254 — Philadelphia Pump Div., American Meter Company, 13500 Philmont Ave., Philadelphia 16, Pa.

Check 1782 opposite last page.

### Packaging story

Bulletin of eight pages featuring "Birth of a Box" describes and illustrates development of packaging for various products from design through the finished package. Package Laboratory News, July 1957—Hinde & Dauch, Subsidiary of West Virginia Pulp and Paper Co., Sandusky, Ohio.

Check 2348 opposite last page.

### Hydrocarbon wax data

Technical data on use of hydrocarbon wax with polyethylene are in four-page bulletin Paraflint Bul — Moore & Munger, 33 Rector St., New York 6, New York.

Check 2349 opposite last page.

## new, improved DUSTEX COLLECTOR

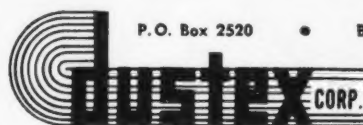
### solves more recovery problems...costs less to install...

A major design improvement on the widely used and highly regarded DUSTEX Collector assures you efficiency — superior to collectors costing much more.

ALL NEW TUBE DESIGN—Longer, larger cast tube produces the following results...

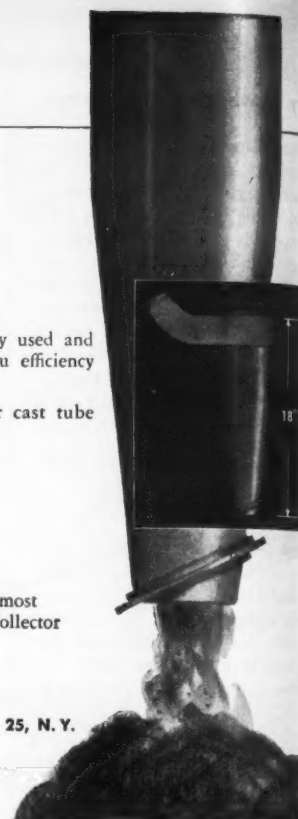
- Greater capacity with less air flow resistance
- Higher abrasion resistance
- Ability to handle inherently sticky materials
- Self-cleaning action
- Highest efficiency ever — at lowest cost

**ALREADY PROVEN** in numerous field tests on the most difficult dusts, the new improved DUSTEX Collector is ready to go to work for you now. Write for descriptive literature and details today.



P.O. Box 2520 • Buffalo 25, N. Y.

Check 2350 opposite last page.



## Rips The "Skin" Off the Toughest Finish

# FAST!



- No silicosis health hazard — safe, clean, sure
- Faster cutting, sharper material known
- Longer lasting, reusable many times
- Moisture-free, no packing due to dampness
- Leaves surfaces absolutely clean — no deposits
- Gives highest degree of etch — better bonding

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FREE WORKING SAMPLE (shipped to you at no cost)



## BLAST GRIT

Manufactured & Distributed by

H. B. REED & CO., INC.  
6618-B Kennedy Ave., Hammond, Ind.

H. B. REED CORP.  
91-B Passaic St., Passaic, N. J.

Check 2351 opposite last page.



## NEW LITERATURE

### Propeller fans catalog

Revised 32-page catalog of manufacturer's line of propeller fans lists sizes, specifications, performance data, and includes dimensional drawings on entire line. Bul A-109C—Hartzell Propeller Fan Co., Piqua, Ohio.

Check 2352 opposite last page.

### Proportioning pump data

Design features and complete data on proportioning pump that accurately feeds chemicals at capacities from 0.11 to 35.6 gph are presented. Bul 1106-2 — Proportioners, Inc., Div. of B-I-F Industries, Harris Ave., Providence 1, R.I.

Check 2197 opposite last page.

### Needle valves

Calibrated needle valves, remote emergency shut-off valves, and remote controls are included in 16-page catalog on laboratory fixtures for gas, air, vacuum, and water. Cat PF-57—Laboratory Furniture Co., Inc., Old Country Rd., Mineola, L. I., N. Y.

Check 2353 opposite last page.

### Protective coating data

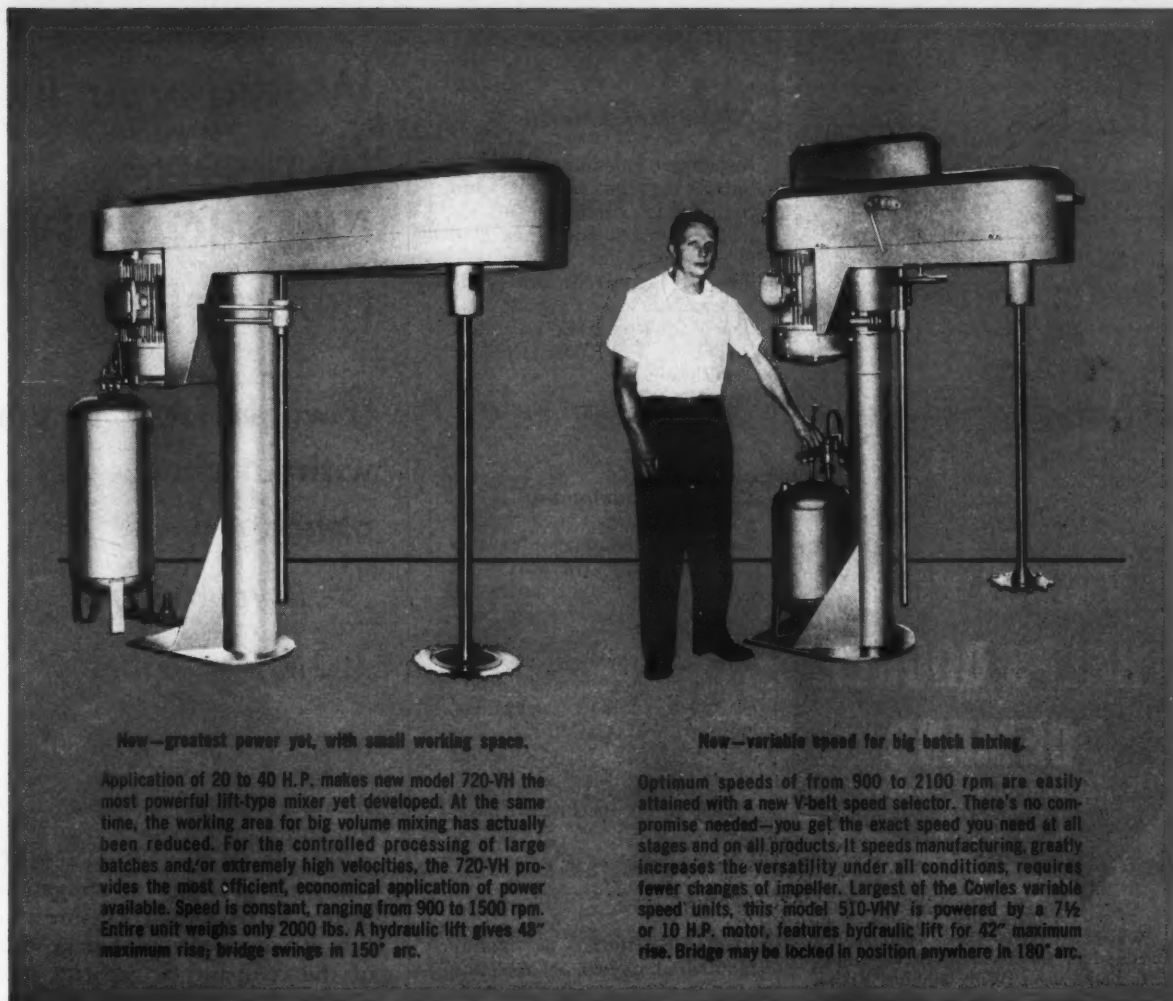
Technical data sheet of eight pages covers odorless, fire-retardant, air-dried coating composed of pigmented polyvinyl chloride resins dispersed in water. No. 88 Tentative Data Sheet — Amercoat Corp., 4409 Firestone Blvd., South Gate, California.

Check 2354 opposite last page.

### Small potentiometers

Bulletin of four pages describes and illustrates company's line of small-size self-balancing electronic potentiometers and bridges. Bul P1271 — The Bristol Co., Waterbury 20, Connecticut.

Check 2355 opposite last page.



**New—greatest power yet, with small working space.**

Application of 20 to 40 H.P. makes new model 720-VH the most powerful lift-type mixer yet developed. At the same time, the working area for big volume mixing has actually been reduced. For the controlled processing of large batches and/or extremely high velocities, the 720-VH provides the most efficient, economical application of power available. Speed is constant, ranging from 900 to 1500 rpm. Entire unit weighs only 2000 lbs. A hydraulic lift gives 48" maximum rise; bridge swings in 150° arc.

**New—variable speed for big batch mixing.**

Optimum speeds of from 900 to 2100 rpm are easily attained with a new V-belt speed selector. There's no compromise needed—you get the exact speed you need at all stages and on all products. It speeds manufacturing, greatly increases the versatility under all conditions, requires fewer changes of impeller. Largest of the Cowles variable speed units, this model 510-VHV is powered by a 7½ or 10 H.P. motor, features hydraulic lift for 42" maximum rise. Bridge may be locked in position anywhere in 180° arc.

## Cowles develops two new multi-phase\* mixers for faster big-volume production

### \*What is Cowles "multi-phase" mixing?

Cowles exclusive mixing principle is based on the unique action of the patented Cowles Impeller. Where ordinary mixers do a partial job by imparting random motion to particles in suspension, the Cowles takes material through several extra phases: Material is thrown off at 60 mph speed from impeller vanes. This creates violent action of the suspension against itself—a zone of "hydraulic attrition" in which particle is sheared and smashed against particle to accomplish truly ultimate dispersion. Direct action of the impeller is thus multiplied many times. At the same time, the entire batch is kept in "total motion", returning to the impeller in a controlled cycle. Result is a speed, thoroughness and predictability unmatched by other methods. Scientific details on request.

THE COWLES PRODUCTION RECORDS of up to 20 times faster ultimate dispersion have brought the inevitable result: user demands for ever larger and more versatile units. And here are the Cowles answers. They are proved for up to 2½ times the per-hour volume you may be used to. On any liquid-base mixing, dispersing, deagglomerating, homogenizing or emulsifying job, the Cowles promises not only greater speed and simplicity, but lower space, power and maintenance requirements.

**The Cowles enjoys the fastest growing popularity in its field.**

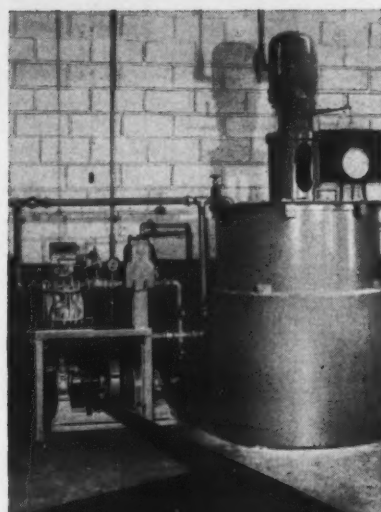
To find out how the most modern mixing methods can benefit your operation, let us prove the Cowles in your plant—at our risk! Write today on your letterhead for complete details.



5716

Morehouse-Cowles, Inc.  
1150 San Fernando Rd.  
Los Angeles 65, Calif.  
Representatives in principal cities  
Convenient lease and time payment plans

Check 2356 opposite last page.



**VIKING PUMP  
HELPS DOUBLE  
DEMAND**  
(for Permafuse Adhesive)

Permafuse Corporation, Westbury, New York, manufactures adhesives for bonding brake linings to brake shoes. With only one Viking J-152 Pump, Permafuse has produced such high quality adhesive that demand has doubled. So they're adding a new heavy-duty Viking K-212 Pump that, with other equipment, will more than double production.

The Viking J-152 Pump does a variety of important jobs for Permafuse: 1. It pumps resins, synthetic rubber plasticisers, solvents and catalysts from drums and tanks to processing kettle. 2. It then circulates and blends materials for 24-hour periods. 3. After processing, the Viking Pump delivers adhesive through meter and filling machine into cans and drums.

Vikings can do multiple job pumping for you, too. For information, see your nearby Viking distributor, or write for bulletin 57S cc.

VIKING — the leader,  
not a follower,  
in Rotary Pumps



**VIKING**  
Pump Company  
Cedar Falls, Iowa  
In Canada, it's "ROTO-KING" pumps

See Our Catalog In

Sweet's Plant Engineers File

Check 2357 opposite last page.

## NEW LITERATURE

### Crystal lattice models

Instructive models of crystal lattices of the elements and compounds, minerals, and alloys are listed and illustrated in 6-page folder. Uses: industrial research and advanced study. "Crystal Lattice Models"—A. S. LaPine & Co., 6001 S. Knox, Chicago 29, Illinois.)

Check 2357A opp. last page.

### Conveyor equipment

Catalog of 88 pages features manufacturer's transmission products and their uses in elevating and conveying machinery. Descriptive information, with drawings and tables of dimensions, covers variety of shaft collars, couplings, clutches, etc. Cat 914 — The Jeffrey Mfg. Co., Columbus 16, Ohio.

Check 2358 opposite last page.

### Alloys

Brief description of manufacturer's corrosion resisting alloys and equipment, including pumps, valves, and filters are presented in 12-page illustrated catalog. Lists of corrosive solutions and recommended alloys are included. Cat 58 — The Duriron Co., Inc., Dayton 1, Ohio.

Check 2359 opposite last page.



Submitted by Albert B. Fox, Struthers Wells Corp., Warren, Pa.

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\*"Substantial operations" does not necessarily mean an extremely large plant. But requests for the magazine exceed supply so we must set standards to insure publication being sent where it can be used to best advantage.

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Main Products

#### Details on oil coolers

Company's line of oil coolers used for cooling fluids in lubricating, power, and processing applications are detailed in four-page bulletin. Design, operating, and specification data, along with handy sizing system, are included. Bul 12C — Schutte and Koerting Company, Cornwells Heights, Bucks County, Pa.

Check 2360 opposite last page.

#### Power reactor systems

Bulletin of 28 pages reviews reactor systems to produce commercially useful electricity from nuclear energy. Detailed picture and word description of various systems using water, gas, sodium, and liquid-fuel as coolants is presented. Bul GER-1384 — General Electric Apparatus Sales Div., General Electric Co., Schenectady 5, New York.

Check 2361 opposite last page.

#### Valves for atomic uses

Bulletin of eight pages illustrates and describes valve prototypes of new designs that meet the peculiar requirements of water and steam service in nuclear reactors. Included are self-actuated relief valve, check valve, and globe valve. "Valves for Atomic Power" — Manning, Maxwell & Moore, Inc., Stratford, Connecticut.

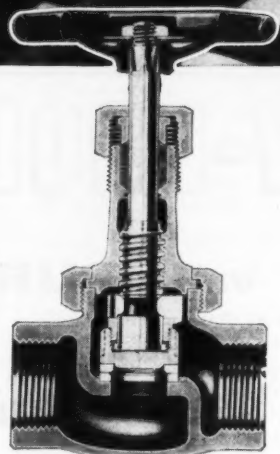
Check 2362 opposite last page.

#### Push-button unloading

Features of car shaker responsible for increases up to 750% in unloading volume are described in six-page bulletin. Specifications for unit, designed for safe, fast, and economical push-button unloading of granular material from open, hopper-bottom gondola cars, are included. Bul 07B7-221B — Allis-Chalmers Mfg. Co., Milwaukee 1, Wisconsin.

Check 2363 opposite last page.

## IT'S TIME TO CUT *Maintenance* COSTS



### LQ600

Backed by cost-cutting Distributor service . . . you can't beat the exclusive LQ600 for cost reduction. Its patented Brinallloy® seats and discs outwear even 500-Brinell or 1000-Brinell case-hardened stainless.

At no time in history have industrial valve maintenance costs been so high. Labor costs are skyrocketing. Add in your maintenance department overhead and the production time lost because of valve breakdowns, and your total maintenance cost figure is pretty close to the danger mark. The price of an ordinary valve is actually dwarfed by the cost of keeping it in operation. That's why it always pays to install *the best valves you can buy*. For nearly a hundred years, they've been made by The Lunkenheim Company, Cincinnati 14, Ohio.

The cost of a LUNKENHEIMER VALVE  
*Gets smaller . . . and smaller . . . and smaller*  
with each passing year of dependable service.

BRONZE • IRON • STEEL • PVC®  
**LUNKENHEIMER**  
THE ONE *Great* NAME IN VALVES  
L-557-10

Check 2364 opposite last page.





## Your New Sealing Problem May be an Old One to Us . . .

### FREE ENGINEERING COUNSEL . . .

We invite you to  
submit details on  
your sealing needs.

FOR 40 YEARS Durametallic has built up an extensive Service Record File. It covers answers to hundreds of specific sealing problems. In all probability we have the answer to your sealing problem in this "success" file.



Check 2365 opposite last page.

## RIETZ ADVANCED EQUIPMENT FOR

### SIZE REDUCTION

DISINTEGRATORS  
PREBREAKERS  
for  
Pulverizing  
Crushing  
Disintegrating  
Cutting  
Homogenizing  
Delumping  
Fiberizing  
Shredding  
of  
Fine or Coarse  
Wet or Dry  
Solids and/or Liquids

### MIXING

DISINTEGRATORS  
for Continuous Mixing  
and Blending of  
Solids with Solids;  
for Suspending  
and Dispersing  
Solids in Liquids.

EXTRACTORS  
for Continuous Mixing  
of Solids and Liquids  
to produce Heavy Pastes  
or Plastic Masses.

THERMASCREWS  
for Batch Blending of  
Solids with Liquids  
with simultaneous  
Heating or Cooling.

### HEAT EXCHANGE

THERMASCREWS  
for Cooling of Dry Solids  
from High Temperatures  
(above 1000° F);  
utilizing Minimum Space;  
eliminating Dust Losses;  
for a wide range of  
special Heat Exchange  
applications—Heating,  
Drying, promoting Chemical  
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LABORATORY FACILITIES  
ARE AVAILABLE TO THE  
Chemical Industry at both  
Santa Rosa, Calif., and  
West Chester, Penn., for  
the testing of your product  
with Rietz Equipment on all  
of these unit operations.

**Rietz**

Visit Rietz in Space No. 1231—Chemical Exposition

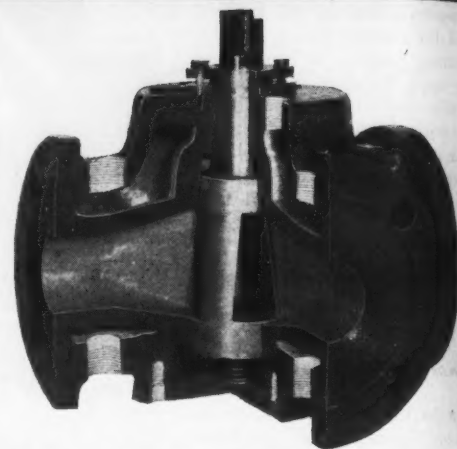
**MANUFACTURING CO.**  
Santa Rosa, Calif. • West Chester, Penna.

Check 2366 opposite last page.



## Jacketed Spring Loaded PLUG VALVES

- 2-WAY OR STRAIGHT  
SPRING LOADED
- 3-WAY SPRING LOADED
- ANGLE SPRING LOADED
- AIR CYLINDER  
OPERATED SPRING  
LOADED—all sizes  
and types



### LONG ON SERVICE . . . SHORT ON MAINTENANCE

H & B's new fully jacketed spring loaded plug valves feature an inverted tapered plug inserted and lapped into the housing from the bottom of the valve—then spring loaded. The spring wedges the plug to a perfectly tight seal, eliminating troublesome leaks. Easy to operate—no big handwheel . . . no freeze . . . no "breaking loose" necessary. Easy to clean. Made in two port or multi port design, with any special stop arrangement desired.

Bulletin J-57 sent on request

HETHERINGTON & BERNER INC., 711 Kentucky Ave., Indianapolis 7, Ind.

Check 2367 opposite last page.

# BY-PRODUCTS...

**will PURCHASE  
or REFINE . . .  
for your account.**

The facilities and experience of Truland may be employed advantageously for the economical upgrading and disposal of solvent mixtures and organic by-products. Our technically trained personnel are available to discuss the refining of any solvent mixture or organic by-products.

Send for new booklet  
which describes our  
operation



Division of The Trubek Laboratories Incorporated  
Check 2368 opposite last page.

CHEMICAL PROCESSING

oaded  
VES

ENANCE

re an inverted  
bottom of the  
perfectly tight  
handwheel ...  
de in two port  
d.

anapolis 7, Ind.

3000

nt.



corporated

PROCESSING

Exploring new frontiers in  
**BORON**  
CHEMISTRY  
Second in a series



**BORON SHAPES** for control rods and  
shielding in nuclear reactors, supplied  
through our National Northern Division,  
West Hanover, Mass.

## ELEMENTAL BORON

To meet your growing  
requirements, **TRONA**<sup>®</sup>  
offers a versatile  
selection of these  
standard and special  
grades...

STANDARD 90-92%  
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SODIUM REACTIVE

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The selectivity available to you with  
Trona Elemental Boron is the natural  
result of AP&CC's long pioneering  
leadership in Boron Chemistry. If  
you're concerned with the many new  
development possibilities of Elemental  
Boron — its Ordnance uses, high  
temperature applications or nuclear  
aspects — we suggest you call your  
nearest Trona representative, or write

MARKET  
DEVELOPMENT  
DEPARTMENT



**American Potash  
& Chemical Corporation**

3030 West Sixth Street | 99 Park Avenue  
Los Angeles 54, Calif. | New York 16, New York

Check 2369 opposite last page.

## NEW LITERATURE

### Mixers, grinders

Latest of manufacturer's mix-  
ing, grinding, and dispersing  
equipment for various applica-  
tions is illustrated and de-  
scribed in bulletin. Bul 3C —  
Charles Ross & Son Co., 148  
Classon Ave., Brooklyn 5,  
New York.

Check 2369A opp. last page.

### Boron isotope info

Answers to questions con-  
cerning boron 10 and 11 are  
in 16-page guide. Gives uses,  
and chemical, physical, and  
nuclear properties. "Boron and  
Its Isotopes"—Write Chief,  
Niagara Falls Branch, Atomic  
Energy Commission, PO Box  
338, Niagara Falls, N.Y.

Check 2370 opposite last page.

### Tape wrapping machines

Specifications and construc-  
tion details on two power-  
operated tape wrapping ma-  
chine models and three man-  
ually-operated models are  
available in four-page illus-  
trated bulletin. Tape Wrapping  
Machine Bul — Plicoflex, Inc.,  
5501 Santa Fe Ave., Los An-  
geles 58, California.

Check 2371 opposite last page.

### Chemicals, metals listed

Catalog of 16 pages lists and  
prices over 1000 organic and  
inorganic chemicals, and met-  
als, available on commercial  
scale. Product Cat — Kern  
Chemical Corp., 8639 Venice  
Blvd., Los Angeles 34, Calif.

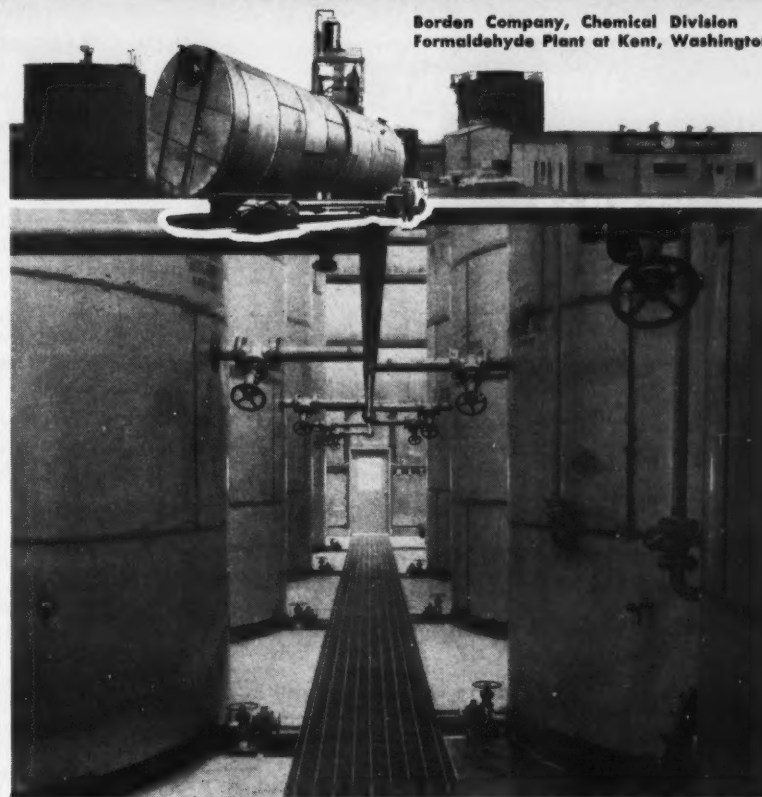
Check 2372 opposite last page.

### Valve catalog

Manufacturer's line of valves,  
driers, strainers, and acces-  
sories for refrigeration, air  
conditioning, and industrial  
applications are listed in 16-  
page catalog. Dimensions and  
specifications are included. Cat  
102 — Henry Valve Co., 3215  
North Ave., Melrose Park, Ill.

Check 2373 opposite last page.

Borden Company, Chemical Division  
Formaldehyde Plant at Kent, Washington



For new Western plant . . . .

## Borden's Chemical Division calls on Puget Sound Fabricators for custom stainless steel fabrication

Now "on stream" and serving the  
growing requirements of industry  
in the Pacific Northwest is the for-  
maldehyde plant at Kent, Washing-  
ton, constructed and operated by  
the Chemical Division of the Bor-  
den Company. The bulk of the  
plant's annual production of 36 mil-  
lion pounds of formaldehyde will  
go to customers in the plywood,  
hardboard and particle board fields  
for use in synthetic and wet  
strength resins.

Working from exacting specifica-  
tions supplied during early phases  
of plant design and engineering,  
Puget Sound Fabricators handled  
the custom fabrication of ten stain-  
less steel formaldehyde tank farm  
vessels, each measuring 14' in di-  
ameter and 18' in length with a storage  
capacity of 20,000 gallons. In addi-  
tion two 50,000 gallon methanol

storage tanks were also field erected  
at the Kent plant site.

The combination of specialized  
knowledge and experience in work-  
ing with stainless steel together  
with Puget Sound Fabricators' "on-  
the-spot" proximity to the job re-  
sulted in substantial savings in  
transportation costs and manufac-  
turing time.

If you are contemplating new  
construction or planning the expan-  
sion of existing facilities in the  
West, you can rely on this same fab-  
ricating know-how and realize the  
same savings in time and transpor-  
tation on your process and plant  
equipment requirements. We wel-  
come the opportunity to consult and  
quote prices from your prints on  
any job involving the fabrication of  
steel and alloys up to 1" in thick-  
ness.



**PUGET SOUND  
FABRICATORS, INC.**

3670 E. Marginal Way Seattle 4, Wash.

for complete information on facilities  
and services write for Brochure No. M-56



Check 2374 opposite last page

NOVEMBER 1957



## UNIVERSAL

Standard Stock  
**BRONZE**  
Flexible HOSE  
CONNECTORS



OFFERING

Leakproof Connections

Minimum Installation Time

Perfect Alignment of  
piping hook-ups

Elimination of Vibration and Expansion

Write for —

Industrial UC3 Bronze Connector Bulletin



Quality . . . ALL METAL FLEXIBLE HOSE PRODUCTS

**UNIVERSAL METAL HOSE CO.**

2189 South Kedzie Avenue • Chicago 23, Illinois

Check 2375 opposite last page.

## GASKETS • SHIMS WASHERS

From 1 to 1 Million



No matter what type, thickness, shape or quantity required, you can count on Chicago-Wilcox for uniformly accurate gaskets, shims, washers or special stampings.

With 50 years accumulation of dies, chances are we can furnish just what you need without a die charge—thus reducing costs substantially and assuring on-schedule delivery.

Gaskets, shims and washers can be supplied in metallic, non-metallic and plastics . . . teflon, nylon, etc. . . and in quantities to meet your production requirements.

Write for catalog and submit your specifications for quotation.

**CHICAGO-WILCOX MFG. CO.**

7717 South Avalon  
Chicago 19, Illinois

Check 2376 opposite last page.

## NEW LITERATURE

### Plastic petri dishes

Manufacturer's line of disposable, single-use plastic petri dishes, including 100 x 20 mm square dishes, counting plates, divided dishes, and regular circular dishes are detailed in 12-page catalog. Cat 57D—Chicago Apparatus Co., 1735 N. Ashland Ave., Chicago 22, Ill.

Check 2377 opposite last page.

### PVC pipe

Manufacturer's regular and high-impact corrosion-resistant rigid polyvinyl chloride pipe is described in 12-page bulletin. Sizes, applications, properties, temperature factors, support spacing, and thermal expansion are all presented in tabular form. Bul A557—Alpha Plastics, Inc., Okner Pkwy., Livingston, N.J.

Check 2378 opposite last page.

### Rotary kiln control

Advantage of rotary kiln firing-temperature measurement, and description of how manufacturer's equipment is applied for reliable measurements are covered in four-page data sheet. Photographs and diagrams illustrate all details of system and its installation. Data Sheet 705 (2) — Leeds and Northrup Co., 4934 Stenton Ave., Philadelphia 44, Pa.

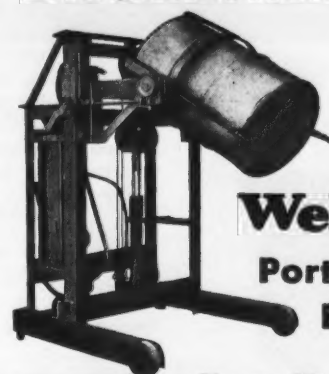
Check 2379 opposite last page.

### Sodium dispersions

Reactions utilizing sodium dispersions, design and operation of lab through plant-scale equipment, procedures for several reactions, equipment layout for continuous preparation of sodium dispersions, and a good bibliography are covered in 44-page 2nd edition of "Sodium Dispersions"—US Industrial Chemicals Co., 99 Park Ave., New York 16, N.Y.

Check 2380 opposite last page.

## Simplify, Speed Up DRUM HANDLING



with  
New

## Weld-Bilt Portable Drum Elevator



You can lift, transport, store and DUMP all sizes of drums faster, easier, with this new WELD-BILT Portable Drum Elevator. Unique worm-gear tilting mechanism makes "last-drop" dumping safer, more efficient, with minimum effort. Lift, electric-hydraulic operated, is also available for hand operation or fully electrified. Jack-up type steering permits easy, safe positioning.

Write for price on  
this important time  
and labor-saver.

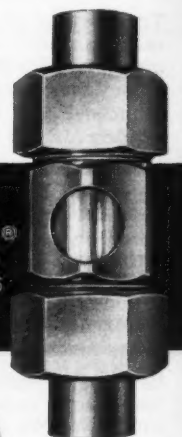
**WEST BEND EQUIPMENT CORP.**  
MATERIALS HANDLING ENGINEERS

322 Water Street, West Bend, Wisconsin

Check 2381 opposite last page.

## Proved on Thousands of Installations!

"250" SERIES  
**LIQUID EYE**  
POSITIVE SEALING INDICATORS  
designed to save you  
even more time and money



### DESIGN FEATURE

extension-gasket . . .  
**ALL ONE-PIECE!**  
A built-in gasket that's  
always in place for positive  
sealing and fool-  
proof assembly.



6 sizes now available:  
 $\frac{3}{8}$ ",  $\frac{1}{2}$ ",  $\frac{3}{4}$ ",  
 $\frac{7}{8}$ ",  $1\frac{1}{4}$ " and  $1\frac{1}{2}$ "  
O.D.S.

The "250" has all the proved Liquid Eye advantages plus these newly engineered features:

- smaller—more compact, simplified design.
- preformed copper extension eliminates need for separate gaskets—foolproof installation.
- complete, self-contained, economy unit.

Write today for catalog E-57  
covering the complete Allin line.

Iron pipe sizes are available,  
with same proven design as  
"250" Series, in  $\frac{1}{4}$ " through  
 $1\frac{1}{4}$ ".



**ALLIN MANUFACTURING CO.**  
410 N. Hermitage Ave. • Chicago 22, Illinois  
Over 1,000,000 Liquid Eyes Sold to Date!

Check 2382 opposite last page.

CHEMICAL PROCESSING



d Up  
LING

with  
New

-Bilt  
e Drum  
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rt, store and  
drums faster,  
ew WELD-  
e worm-gear  
" dumping  
effort. Lift,  
available for  
ack-up type

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ENGINEERS

nd, Wisconsin



now avail-  
" 1/2", 3/4",  
and 1 1/2"

antages plus

d for sepa-

are available,  
n design at  
1/8" through

IG CO.  
22, Illinois  
to Date!

CESSING

## NEW LITERATURE

### Testing and degradation of ethylene polymers

Properties of linear versus regular-grade polyethylenes are covered in 40-page booklet PB-121924, costing \$1. Investigation of mechanism of polyethylene degradation both in absence and presence of oxygen is discussed in 24-page bulletin PB-121682, costing 75c. Remit direct to Office of Technical Services, US Dept. of Commerce, Washington 25, District of Columbia.

### Securing rail shipments

Four-page folder describes five basic methods of securing rail shipments with steel strapping. Photographs and diagrams clearly illustrate methods. List of recommended car loading tools and accessories is included. Bul SPD-171 — Signode Steel Strapping Co., 2600 North Western Ave., Chicago 47, Illinois.

Check 2383 opposite last page.

### Valve lubricating manual

Illustrated lubricating manual of 12 pages contains detailed information on how to select right plug-valve lubricant and how to apply it. Two-page chart lists more than 560 flow materials which lubricated plug valves service, with recommended lubricant number. Valve Lubricating Manual — Walworth Co., 60 E. 42nd St., New York 17, New York.

Check 2384 opposite last page.

### Inside info on lift truck

Large "phantom view" of manufacturer's 20,000-pound capacity fork lift truck permits study of internal working features. Bulletin of 16 pages describes and illustrates operation and applications. Bul 5230 — Yale Materials Handling Div., Yale & Towne Mfg. Co., 11000 Roosevelt Blvd., Philadelphia 15, Pa.

Check 2385 opposite last page.

**---JET-ACTION does the job!**

*More than  
4800 hours<sup>†</sup> on  
Ground Gypsum  
Dust . . .*

**NO DOWN-TIME  
FOR  
MAINTENANCE!**

SCHEMATIC DIAGRAM SHOWING FLOW OF AIR AND ARRANGEMENT OF FILTER CYLINDERS.

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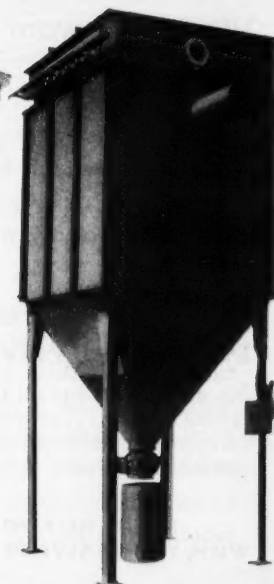
We'll be glad to have the Mikro Man call to show you and your plant engineers the tremendous advantages of MIKRO-PULSAIRE.

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*The Mikro-Pulsaire  
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- High filter ratio

Model 48-6 MIKRO-PULSAIRE—340 sq. ft. of filter area—capacities 2000-5000 cfm. Modular construction permits selecting a unit for just about any dust collection job.



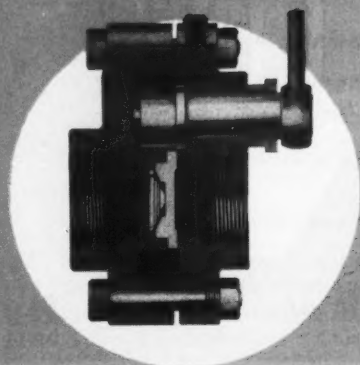
**Mikro-D PULVERIZING MACHINERY DIVISION**  
METALS DISINTEGRATING COMPANY INC.  
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Check 2386 opposite last page.

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No other valve has all the Everlasting features... proven by half a century of service to assure dependable, leak-tight service.

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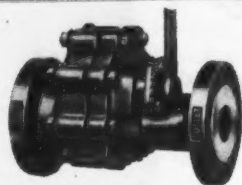
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Quick acting, also handwheel operated "Y" and angle types. For pressures up to 600 psi.



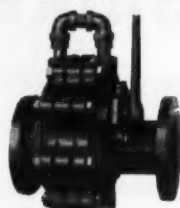
### GENERAL SERVICE

Where drop-tight seal and full flow is essential.



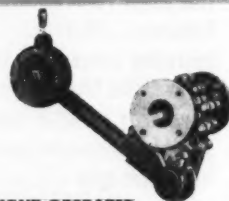
### CYLINDER OPERATED

Can be remotely controlled, electrically or manually.



### STEAM JACKETED

Assures free flow of viscous materials.



### WEIGHT-OPERATED

For automatic drains or emergency shut off.

# Valves

## Engineers Should Be Licensed From page 28

fits of registration in terms of job values must be considered to exist, but in the realm of the intangible. It is in this realm, however, that much of the personal progress in professional growth is accomplished.

The nature and extent of these benefits might be illustrated in a statement by C. Y. Thomas, Vice President of Spencer Chemical Company. Speaking at a recent conference on registration, Mr. Thomas pointed out that, "... When we now interview a young man who has not taken the engineering licensing examination, there immediately comes to mind that the individual was possibly afraid to take the examination and might not be thoroughly competent."

The implication here is not that a "yes" or "no" answer would determine whether or not the applicant got the job. What is implied is that when this particular firm looks over the qualifications of a prospective employee there are questions asked concerning the professional stature and attitudes of that individual.

### Aids Professional Development

For the engineer employed in industry, registration provides a strong stimulus to undertake certain projects which are too often delayed or neglected. Registration gives a young engineer a greater awareness of his role as a member of a profession. Registration tends to aid in the development of what might be called a consciousness of professional growth.

Registration also leads to a heightened confidence in professional achievement. An engineer who has met the state requirements for registration knows that his education, experience, and ability are recognized by a board of engineering examiners as adequate for the practice of his chosen profession.

These things are difficult to record and measure, but they are none the less real. Our industrial technology is forging ahead at a fantastic pace. The

engineer of the near future will have to operate at the level of today's Ph.D. and research scientist in, order to perform the engineering tasks which will be expected of him. Registration examinations provide a framework for evaluating an individual's background and capacity for technical work. These examinations offer a testing scale which is independent of both the engineering school and day-to-day engineering operations.

### Management Should Stress Registration More

While engineering executives and serious students of engineering career problems have become sold on the values of registration, the situation is considerably different among engineers whose attention is completely absorbed by the technical aspects of their jobs. One of the conclusions reached in a recent NSPE study entitled "Career Satisfaction of Professional Engineers in Industry", was that management was not doing an adequate job in bringing out the advantages of registration for engineers in industry.

In the study it was found that nearly two-thirds of the engineers surveyed regarded



"He's a chemical operator; he's making a batch of resin by remote control!"

Our thanks to Ken Boyea, Hercules Powder Co., Holyoke, Mass.

Check 2387 opposite last page.



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engineering tasks  
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Boyes, Hercules  
Mass.

PROCESSING

registration as "not valuable" for their own careers. The study also showed that more than 50 percent of the industry engineers who were registered stated that registration was "not very valuable" for persons in their position. Apparently, more specific recognition of registration on part of management is needed if engineer employees are to receive this encouragement.

#### Bulwark Against Unionization

I personally believe that registration is one of the strongest bulwarks against the unionization of engineers in industry. The registered engineer has a better perspective on the distinction between professional employees and the bulk of the industrial workers. The engineer who looks to professional growth as a means of personal advancement will likely be the individual who recognizes registration as another resource for nourishing this growth.

The union appeal has been successful among engineers in certain areas primarily because of a failure on both the part of management and on the part of engineers themselves to recognize the distance along the road to professionalism that engineering has come in the past half-century.

The engineer cannot justify an appeal for professional recognition on Monday, and an appearance in a picket line on Tuesday. Engineering is not piece-work, and engineering salaries cannot be computed in

terms of the same criteria which are used to set hourly wages for skilled and unskilled workmen. The concept of registration and professionalism is simply incompatible with unionization.

#### First Law Enacted 50 Years Ago

The year 1957 marks the 50th anniversary of the adoption of the first state registration law. It was 40 years after the first law went on the books in Wyoming, that the Montana legislature adopted a registration law, and all 48 states were in the fold. The campaigns for registration laws in each of the states were part of the general effort by engineers to build up professional recognition in the eyes of their employers, the law, the general public, and their own colleagues.

At the beginning of this article I stated that I believed any individual performing engineering work should be required, by law, to be registered. I hold this view because I feel that any engineer doing recognized engineering work is practicing a profession. He should therefore be authorized by law to engage in this professional practice.

In view of the situation in the engineering field today, it is easy to come to the conclusion that registration will never be required for all engineers. But one must not lose sight of the general trend of events. In engineering, this is slowly but surely headed toward professionalism.

#### The Second Polyethylene Rush From page 29

have been justified. But if all of the current market forecasts should be reasonably accurate there will probably be more long faces than happy ones on the polyethylene scene.

Here's why: It's simply a case of more material than market. Four plants are producing high-density polyeth-

ylene now — Grace, Celanese, Hercules, and Phillips. Carbide has two more close to operation, Koppers should be running late in the year or in early 1958. The total combined capacity of these seven plants will be on the order of 280 million pounds per year. And Dow has announced plans for a unit of undisclosed ca-

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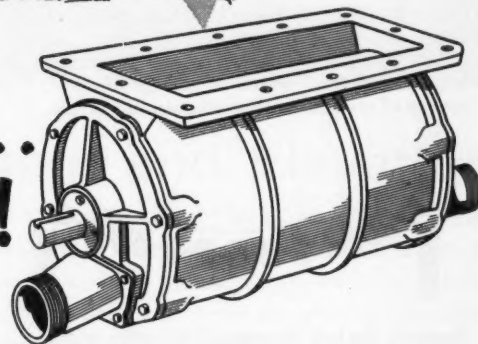
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## 26<sup>th</sup> Exposition of CHEMICAL INDUSTRIES NEW YORK DEC. 2-6

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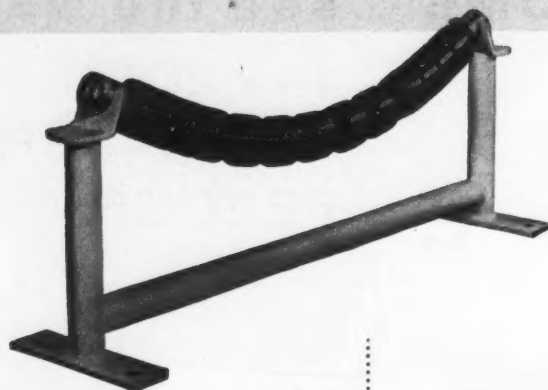
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Check 2388 opposite last page.



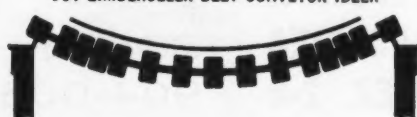
*We've been asked...*

## "WHAT IS THE JOY LIMBEROLLER BELT CONVEYOR IDLER?"

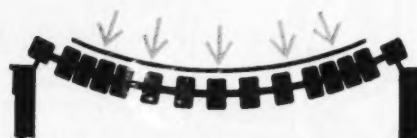


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CONVENTIONAL IDLER



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Check 2389 opposite last page.

## Second Polyethylene Rush

*From preceding page*

capacity to be in operation by late next year.

And these are by no means all of the companies involved: Goodrich-Gulf, Monsanto, and Du Pont all have Ziegler licenses; at least one will be announcing construction plans soon. Spencer and Eastman

### After Deadline

Du Pont has indeed, announced plans to get into the linear polyethylene business. The company is making studies and cost estimates on a proposed unit at Laplace, La. Final decision on the plant will be contingent on the outcome of the studies, according to R. L. Hershey, general manager of the polychemicals department.

Du Pont holds a license from Dr. Karl Ziegler but is known to have been working on its own low-pressure process.

both have Standard of Indiana licenses and are almost certain to go through with their plans. And it's rumored that US Rubber also has a Ziegler license although this hasn't been admitted publicly yet.

Assuming that each proposed plant might have a capacity of 50 million annual pounds — not excessive judging by the existing plants — the capacity potential is on the order of 630 million pounds. This, as a matter of fact, is the level that producers are figuring on for 1960.

High-density polyethylene sales are expected to progress something like this: The 1958 volume will almost certainly be under 100 million pounds, 1959 should see sales of be-



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### Answers To Test On Page 125

- |           |              |
|-----------|--------------|
| 1) (c)    | 6) A         |
| 2) 4      | 7) 10 or (d) |
| 3) (a)    | 8) (c)       |
| 4) 1      | 9) A         |
| 5) \$6.00 | 10) 40 min   |

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CHEMICAL PROCESSING

tween 150 and 180 million pounds. By 1960 the material will probably see sales of around 250 million pounds.

The most enthusiastic market development people expect the 1961 market to be on the order of 400 million pounds. Less enthusiastic guesses — also from people in the high-density business — maintain that it'll still be running around 300 million pounds or even less. Even if these higher figures hold true the whole industry will be placed in the position of operating at something like 65 percent of capacity, hardly sound economics. Of course, it won't actually work this way: The companies producing higher quality material — and those having the greatest sales power — will have the lion's share of the business, leaving the less successful and aggressive producers a minor share.

The 1961 market breaks down something like this — these are averages of the various projections and some random figures:

**Films:** Guesses run from an annual 30 to 110 million pounds, although 50 or so million might be the most realistic figure. The high-density films will be used in applications where greater strength is needed; their appearance is not up to the current low-density material although there has been considerable progress in terms of clarity and gloss. It will find a substantial market for such things as moisture barriers for concrete foundations and other heavy-duty jobs.

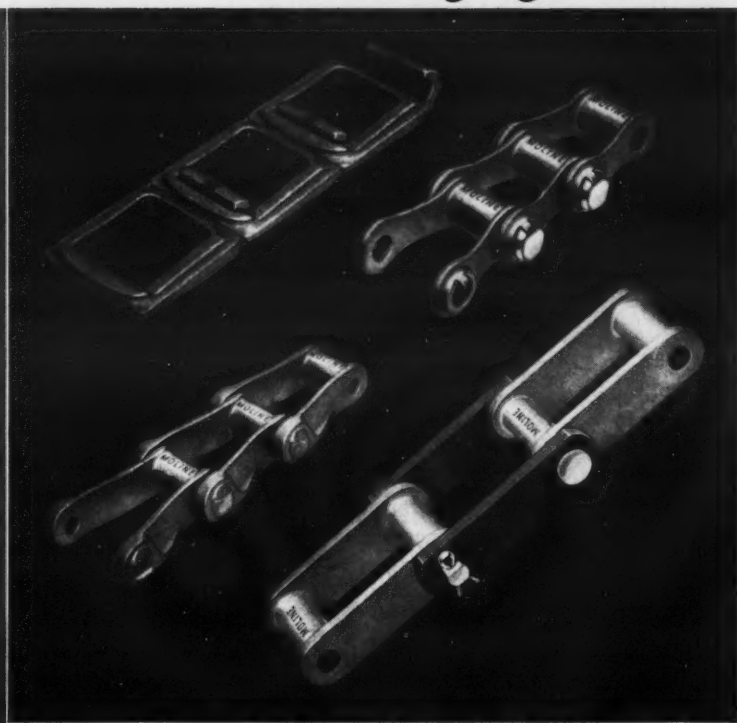
High-density material may occupy as much as a third of the total polyethylene film market.

**Heavy sheet for vacuum forming:** This may turn into a major field for high-density polyethylene. Such things as inner door panels for refrigerators and home freezers can be vacuum-formed from sheet at a relatively low cost. And the rigidity of the material will permit vacuum forming of various items which up to now have been injection molded. The smaller material requirements and the lower fabrication costs are expected

# Moline link attachments adapt Moline Chains to many jobs

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Only a few of the wide variety of Moline Chain attachments are shown here.



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NOVEMBER 1957

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## The Second Polyethylene Rush From preceding page

to open a considerable market.

**Coatings for paper, etc:** This should account for around 15 to 20 million annual pounds, approximately 25 percent of the total polyethylene coatings market.

**Molding:** Estimates vary all over the map, but the high-density material will probably have about one-third of a market which should total about 350 million pounds. Evaluations of the molding potentialities based on early samples of the material were less optimistic: Catalyst residual in some cases reacted with material contained in high-density polyethylene bottles, producing odors and discoloration. This, of course, was one of the first production problems tackled, and it has been solved to the point where any degree of purity can be attained now.

The best guess for injection molding is around 150 or so million pounds for conventional material, 100 million for high-density. For blown containers, the market should be around 50 million pounds for each type.

**Extrusions:** An interesting field, and this is where Allied's new low-pressure material enters the picture. The Allied material's extremely high molecular weight, according to Allied's own data, virtually eliminates the problem of stress cracking under most circumstances. If this proves out in practice, and there's no reason to believe that it won't, then the material will have a good crack at the present plastic pipe market. The material is said to stand up well under various hydrocarbons and soaps and detergents that conventional polyethylene won't handle. Little is known of Allied's capacity or its plans but the producing unit is quite flexible and can be easily expanded as the market develops. Most of Allied's thoughts now concern the pipe market but the material is sure to find broader applications as time goes on.

The pipe market should look something like this: conventional material, 50 to 65 million pounds; high-density material, 15 to 25 million pounds.

The wire and cable market is expected to total over 100 million pounds, of which the high-density material should have 30 or 40 percent. Here, again, stress cracking is a consideration and the low-pressure material is less acceptable than some grades of conventional polyethylene.

The new material seems to have the monofilament field all to itself. The consensus places this market at something like 15 to 20 million annual pounds for high-density material, little or nothing for lower-density polyethylene. This, of course, is hardly surprising; the less dense material has a great tendency to stretch, making it impractical for such things as ropes, chair seats and such. And while the new materials tend to stretch a little, their elongation is within practical bounds.

### High-density/High-pressure

But the battle may not be across the marketing trenches for long . . . the high-pressure producers are making plans to carry the fight over to the low-pressure producers' own ground. In the past the high-pressure producers have, for the most part, limited themselves to making material with densities up to .92. However, it's well known that the high-pressure process can produce materials of higher densities by "just leaving it in the pot a little longer." There are two main drawbacks to leaving it in the pot. The first is cost. As densities go up, the yield comes down, in some cases as much as 15 percent. Hence, the cost might be about the same of competing products by low-pressure process. Also, as the material stays in the pot longer, process control gets more and more difficult.

Still, high-pressure producers predict that densities will reach .96 within a couple of years. Indeed, Spencer already has on the market resins with densities ranging from .93 to .94. And National Distillers is also planning to make more dense material available shortly.

But there's another factor coming from out in left field

Check 2392 opposite last page.



and cable market total over 100,000 tons, of which the material should be 10 percent. Here, packing is a considerable low-pressure less acceptable than of conventional polyethylene. This material seems to be in a filament field all over the world, something like an annual production of 100,000 tons of material, for lower-density polyethylene. This, of course, is a very surprising material has a tendency to stretch, which is practical for such as chair seats and the new material stretch a little, which is within the limits.

#### High-pressure

may not be marketing trenches in the high-pressure making plans to get over to the producers' own past the high-pressure have, for limited them- g material with 1952. However, that the high-pressure can produce higher densities in the pot. There are two ways to leaving it the first is cost too up, the yield in some cases as 10 percent. Hence, the about the same products by low-pressure. Also, as the in the pot control gets difficult.

pressure production densities will in a couple of Spencer already market resins with ing from .93 to .94 Distillers is to make more material available

another factor but in left field

PROCESSING

— polypropylene.

Although it's known that a number of companies are working on polypropylene, heads shake violently when asked about production plans. Yet at least two companies will soon announce that they are going into polypropylene shortly — probably within a year. One producer who figures heavily in the polyethylene picture is now ready, able, and presumably eager to get into the polypropylene business. Up to now, there have been some problems in arrangements for a propylene source close to the company's facilities (propylene will be polymerized with existing polyethylene equipment), but production plans will be announced soon after the first of the year. Another company is known to be well along in its research and wouldn't surprise anyone too much with an immediate announcement.

Almost every company in the field has talked to Italy's Montecatini about licensing its process for polypropylene, but, so far, Montecatini has refused to make the process available, explaining that it wants to have it proved by quantity production first. Now that Montecatini's Milan plant is in production, negotiations may become active again pretty quickly.

And Montecatini as a US producer is not to be discounted. Reports of Montecatini plans to build a US operation are growing but according to Chemore Corporation, Montecatini's US agent, "No decisions have been made."

So it's entirely possible that three polypropylene units will be on stream within a year and a half with a capacity of something like 100 to 150 million annual pounds — and this at a time when the total high-density polyethylene market is expected to be under 200 million pounds.

Polypropylene will be formidable competition for polyethylene. Cost is still a question, of course, but Montecatini estimates that it will be more than competitive with polyethylene.

Few of Montecatini's samples have been available for testing by US companies but more may be coming with the Italian plant now on stream.

The material, trade-named Moplen, has a heat resistance higher than polyethylene of any density. The material's rigidity can be controlled by varying its crystallinity, while most other properties remain constant. And there are samples of polypropylene films almost as clear and glossy as cellophane.

And although this doesn't affect the polyethylene market directly, polypropylene has another property on its side — it can be made into a staple fiber. The raw fiber looks pretty much like slightly gray surgical cotton and has rather a waxy feel to it. Depending on the weave, polypropylene fabrics look very much like wool or rayon or some synthetics. Some of the samples have the slightly waxy feel but it was explained to CHEMICAL PROCESSING that subsequent samples with surface treatments have a completely satisfactory hand. Dyeing problems, too, are reported to have been solved.

It's uncertain whether pure polypropylene fabrics will be made except for certain industrial applications but the producer sees a big market in blends.

The fiber is expected to have a potential cost in the range of rayon fiber.

Competition within the chemical industry is probably second only to the competition within the automotive industry. And competition among makers of high-pressure and low-pressure polyethylene will quite probably reach even new levels for the chemical field. And although the foregoing may have indicated vast infighting between makers of high-density and low-density polyethylene, this isn't slated to be the major battleground. Each material has its own unique properties which pretty well suit each available material to each specific application.

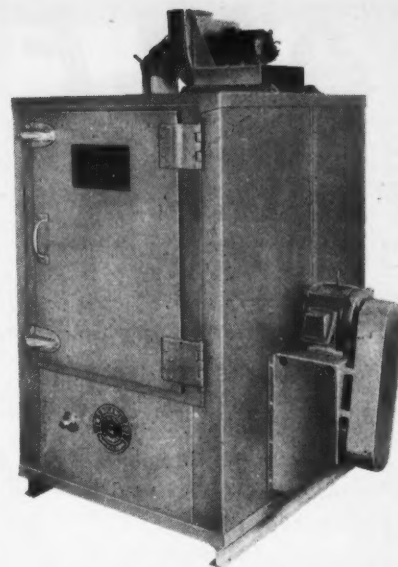
The eyes of the men who must make and sell the annual billion pounds of polyethylene are turned toward completely new markets — both those held today by traditional materials which may have been used for decades, and those which exist today only in someone's research laboratory or on a drawing board.

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CHEMICAL PROCESSING



chemical industry. Chemists, for example, have reaped benefits from the use of reactor by-products in the form of isotopes in physical and biological research, agricultural experiments, and process control.

Radioactive nuclear products are also being used to sterilize certain foods and pharmaceuticals. Radioactive pharmaceuticals, in turn, are rapidly finding a place in diagnostic and therapeutic procedures. It is interesting to note that radiation sterilization is the first promising new principle of food sterilization since Nicholas Appert discovered the art of canning in 1809.

Nuclear energy also may provide potent new tools and methods for use in chemical operations. Radiation itself is a tool of wide applicability. It can be utilized to induce a variety of chemical reactions, including polymerization. The possibility also exists of using radiation to produce chemical-physical reactions, and of using the heat from nuclear fission for endothermic reactions, either directly in a reactor or indirectly with a heat-transfer medium. To realize the full potential of nuclear energy in this area, suitable materials must be found which are able to withstand higher tempera-



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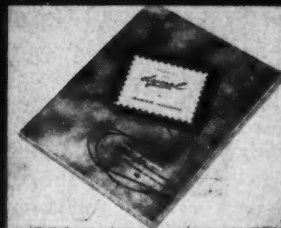
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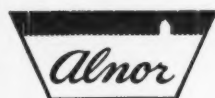
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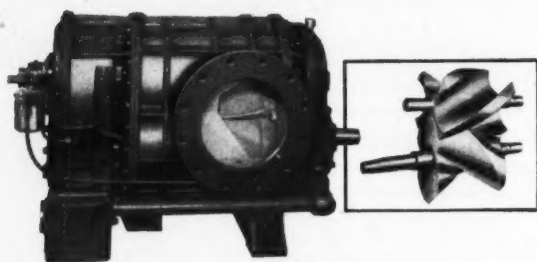
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## Chemistry and the Atom

From preceding page

tures than those we can now employ.

Though current problems may cast some shadows of doubt, the future looks bright for the eventual application of nuclear energy as a tool by the chemical processing industry. Although a few special applications may develop relatively soon, general applications should not be visualized as replacements or alternatives to existing processes or methods, but as a means of solving problems in a better way; or better still, as a means for

## THE AUTHOR...

... W. KENNETH DAVIS was appointed Director, Division of Reactor Development, US Atomic Energy Commission, on February 24, 1955, having served as Deputy Director of the Division since August 1954. He joined the Commission's staff as Assistant Director in charge of the Division's technical projects in April 1954.

After majoring in chemistry at the University of California from 1936-1938, he received degrees of BS (1940) and MS (1942) in chemical engineering from the Massachusetts Institute of Technology.

Davis was Assistant Director, Buffalo Station, MIT School of Chemical Engineering Practice, from 1941 to 1942. He was employed by the California Research Corporation as senior research engineer from 1942 to 1947, and served Ford, Bacon & Davis, Inc. 'till 1949.

He was appointed Associate Professor of Engineering at the University of California in 1949 and became Professor of Engineering in 1953 (while on leave of absence), resigning from the university in September 1953. In December 1950 he joined the California Research & Development Company — a Standard Oil Company of California subsidiary.

solving new problems in perhaps the only way in which they can be solved. In other words, nuclear energy, when applied with imagination and ingenuity by chemists and chemical engineers, offers a new dimension for the development of new and valuable processes.

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the near future. Increasing amounts of acids, alkalis, fluorine compounds, chelating agents, ion-exchange agents, precipitants, and extractants will be required for processing purposes in the nuclear fuel chain.

Economically competitive nuclear power, when it arrives, may affect the chemical industry in still another way — by obviating the need to locate plants having high heat and/or power demands at sites convenient to cheap fuel or water resources. Other considerations will then become paramount in site location.

Though the emphasis herein has been on problems requiring solutions by chemists and chemical engineers, the inference should not be drawn that chemical problems are the only problems requiring solution, or that problems overshadow progress in the nuclear power field. Great strides have been made in applying nuclear energy for peaceful purposes.

Yet the fact remains that economically competitive nuclear electric power and process utilization are not necessarily just around the corner. Attainment of those goals will require the best brains of many professions and industries working together to solve difficult problems through a carefully conceived and well-executed research and development program. Chemistry and chemical engineering have a very important contribution to make to this effort. ■

**CHEMICAL PROCESSING's** Editors are always interested in the opinions of our readers. What are your views on the subjects we cover each month?

"Over The Reader's Shoulder" (page 8) will publish as many letters each month as is possible. Let us hear from you.

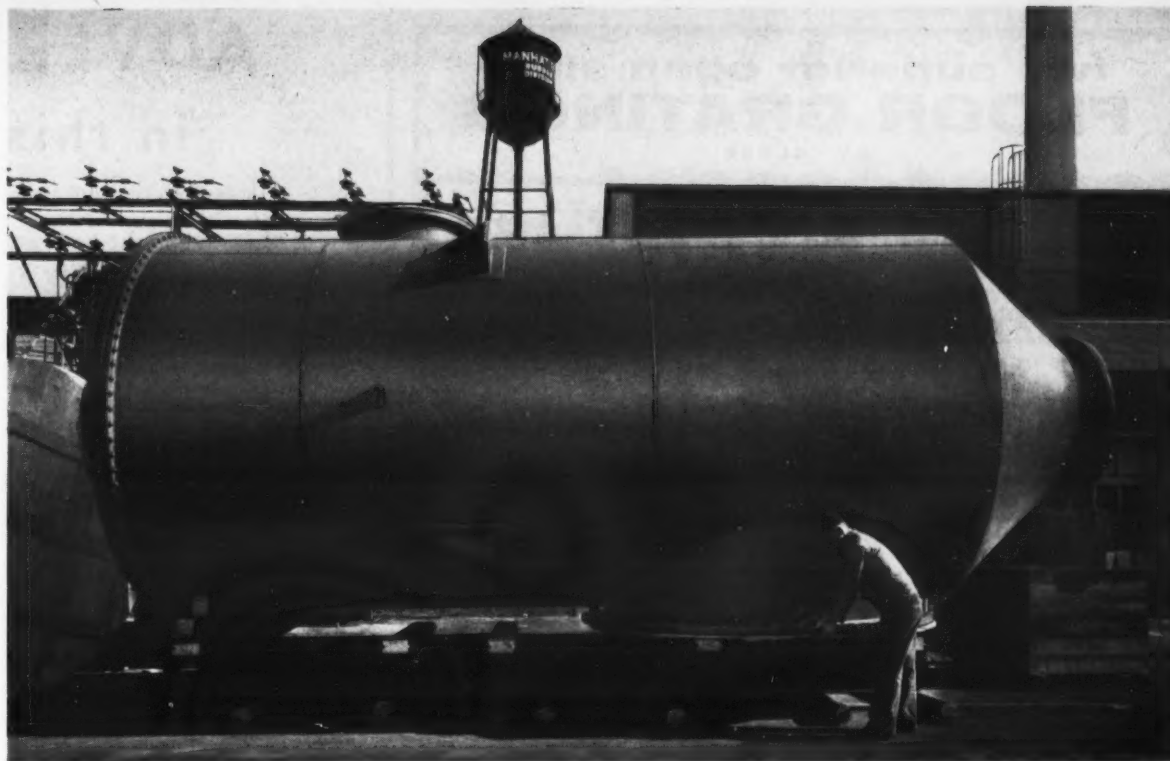


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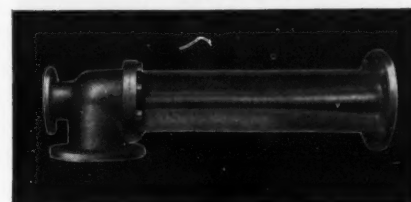
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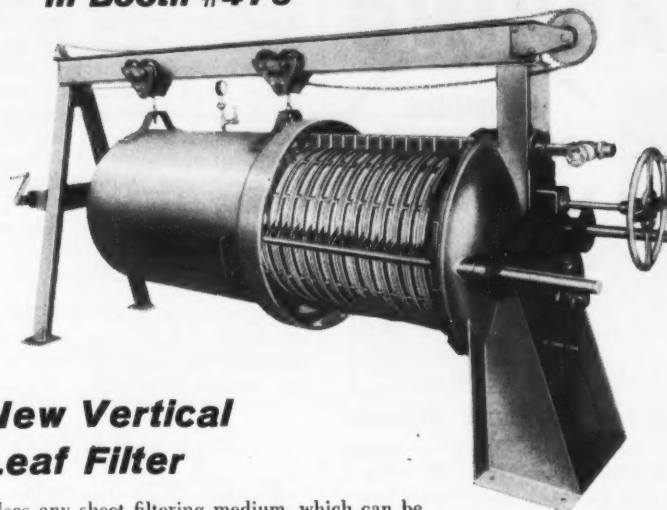
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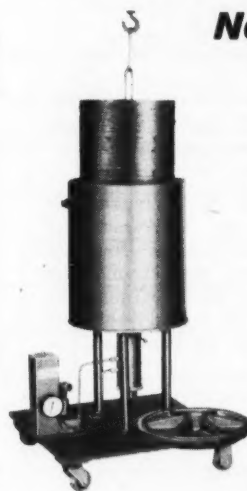


### New Vertical Leaf Filter

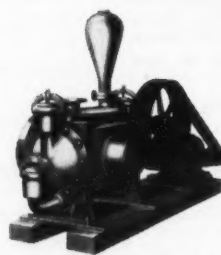
Uses any sheet filtering medium, which can be changed as easily as in a filter press • Can be used as a precoat filter • Adjustable leaf spacing permits build-up of any desired cake thickness • Filter can be readily cleaned, even if overloaded • No pipe connections to break to clean filter.

### New Horizontal Plate Filter

Improved design throughout: Horizontal filter plates retain solids • No scavenger plate needed • No "heel" or unfiltered material in tank • Unit easy to open and filter cartridge readily removed, cleaned and replaced • Hermetically sealed tank prevents leakage • Unit hydraulically closed and quickly put into operation.



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New design eliminates danger of injuring mechanical parts in event of diaphragm failure while pump is in operation • Designed for abrasive, corrosive, heavy or other difficult materials, with reduced maintenance cost • No packings, no leakage • No disturbance of piping when replacing diaphragms.

Other products on display—polymerizing reactor and slabber; wax and resin molding press; new all plastic and plastic-coated metal filter press plates, etc.

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## THAT'S INTERESTING

From page 4

### Wood wastes put to use

Like the squeal in the pig, there's very little of a tree that isn't being put to use. Wood-pulp cellulose treated with acid and ammonia gas has produced a nitrogen fertilizer and soil-conditioner. Fertilizer was produced at UCLA and is still in the lab stage.

### Alcoholic indications

A way to discover potential alcoholics while they are still children has been reported by Dr. Roger J. Williams, Presi-



"You're early boys, he hasn't come in the place yet."

dent of the ACS. He and his associates at University of Texas Biochemical Institute "believe we have found the biochemical basis of alcoholic craving and, better yet, the way it can be prevented or abolished."

### Fast shooting

High-speed photography, 1.2 million pictures per second, is being used by scientists at Wright Air Development Center, to record an explosion wave. It is hoped that the photos will reveal the nature of supersonic waves created and suggest ways to control them for use in jet propulsion. Each supersonic wave is photographed 25 times as it passes an eight-inch observation window, just 1/15,000 of a second.

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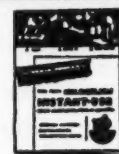
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NOVEMBER 1957

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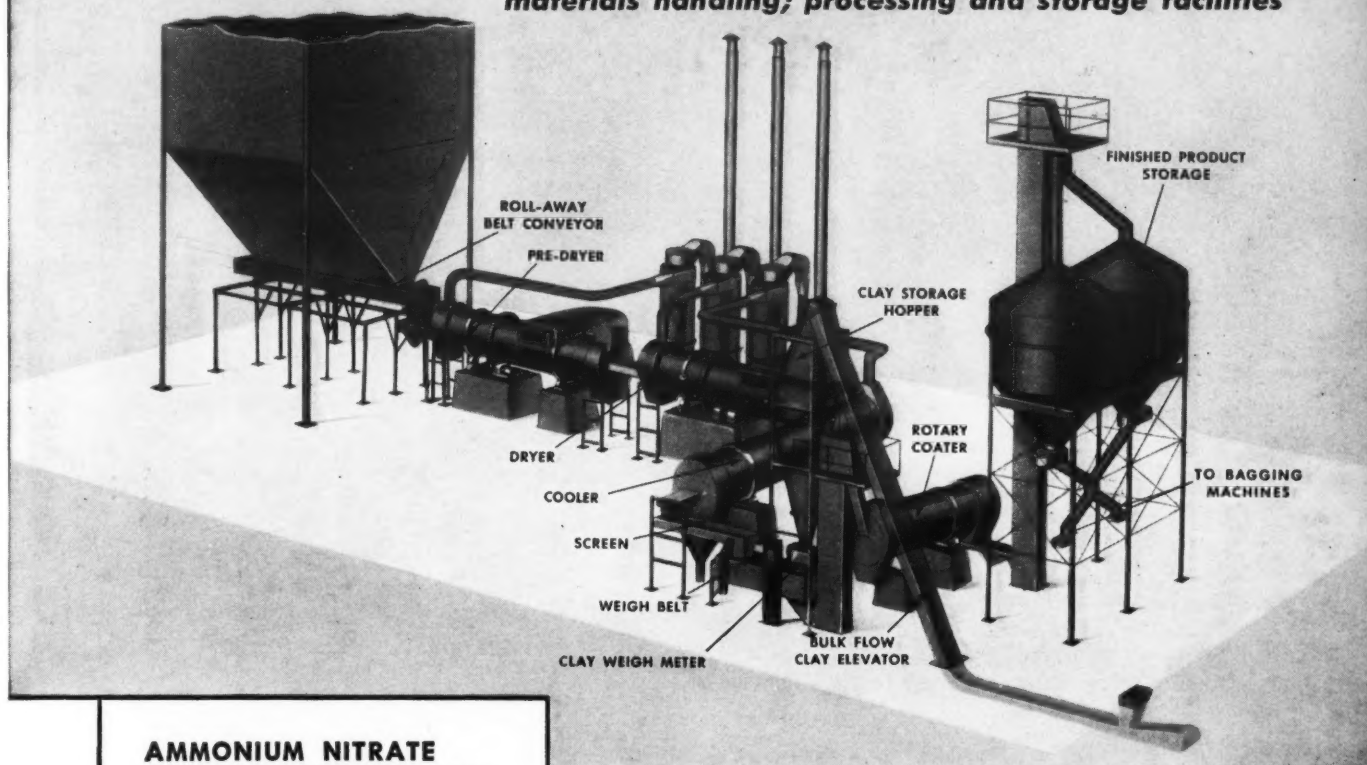
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**CORROSION'S FOCAL POINTS** are easy to detect with a new Amercoat testing method using iron and caustic indicators in a saline gelatin bath. On the welded and scored steel panels shown above after test, unworked surface areas turned red to indicate cathodic properties; but the weld, scores and edges turned

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